

**SERVICE MANUAL****BA-6 CHASSIS**

<u>MODEL NAME</u>	<u>REMOTE COMMANDER</u>	<u>DESTINATION</u>	<u>CHASSIS NO.</u>
👉 <b>KV-27FA310</b>	RM-Y180	US	SCC-S61U-A
👉 <b>KV-27FA310</b>	RM-Y180	CANADA	SCC-S59Q-A
<b>KV-27FS120</b>	RM-Y195	US	SCC-S61N-A
<b>KV-27FS120</b>	RM-Y195	CANADA	SCC-S59J-A
<b>KV-29FA310</b>	RM-Y180	LATIN NORTH	SCC-S60V-A
<b>KV-29FA310</b>	RM-Y180	LATIN SOUTH	SCC-S60W-A
<b>KV-29FS120</b>	RM-Y195	LATIN NORTH	SCC-S73D-A
<b>KV-29FS120</b>	RM-Y195	LATIN SOUTH	SCC-S73E-A

**ORIGINAL MANUAL ISSUE DATE: 3/2004**

👉 :UPDATED ITEM

REVISION DATE	SUBJECT
3/2004	No revisions or updates are applicable at this time.
8/2004	Reissue entire manual Added KV-27FA310 model for US and Canada

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KV-27FS120	RM-Y195	CANADA	SCC-S59J-A
KV-29FA310	RM-Y180	LATIN NORTH	SCC-S60V-A
KV-29FA310	RM-Y180	LATIN SOUTH	SCC-S60W-A
KV-29FS120	RM-Y195	LATIN NORTH	SCC-S73D-A
KV-29FS120	RM-Y195	LATIN SOUTH	SCC-S73E-A



KV-27FS120



KV-29FA310

TRINITRON® COLOR TELEVISION  
**SONY®**

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## SPECIFICATIONS

	KV-27FS120	KV-29FS120 (L. NORTH)	KV-29FS120 (L. SOUTH)	KV-27FA310 & KV-29FA320 (L. NORTH)	KV-29FA320 (L. SOUTH)
<b>Power Requirements</b>	120V, 60Hz	220V, 50/60Hz	120V, 60Hz	120V, 60Hz	220V, 50/60Hz
<b>Number of Inputs/Outputs</b>					
<b>Video</b> <sup>1)</sup>	3			3	
<b>S Video</b> <sup>2)</sup>	1			1	
<b>Y, P<sub>B</sub>, P<sub>R</sub></b> <sup>3)</sup>	1			1	
<b>Audio</b> <sup>4)</sup>	2			2	
<b>Speaker Output (W)</b>	10W x 2			7W x 3	
<b>Subwoofer</b>	N/A			20W	
<b>Power Consumption (W)</b>					
<b>In Use (Max)</b>	180W	175W		220W	215W
<b>In Standby (Max)</b> <sup>5)</sup>	1W	1W		1W	1W
<b>Dimensions (W x H x D)</b>					
<b>mm</b>	768 x 589 x 497 mm			784 x 678 x 520.5 mm	
<b>in</b>	30 1/4 x 23 1/4 x 19 5/8 in			30 7/8 x 26 3/4 x 20 1/2 in	
<b>Mass</b>					
<b>kg</b>	45.2 kg			50 kg	
<b>lbs</b>	99 lbs 10 oz			110 lbs 4 oz	

**Television system**

American TV standard, NTSC

**Channel coverage**

VHF: 2-13/ UHF: 14-69/ CATV: 1-125

**Picture tube**

FD Trinitron® tube

**Visible screen size**

27-inch picture measured diagonally

**Actual screen size**

29-inch measured diagonally

**Supplied Accessories**

Remote Commander RM-Y195

(All Except KV-27FA310/29FA310 Only)

Remote Commander RM-Y180

(KV-27FA310/29FA310 Only)

Two Size AA (R6) Batteries

**TruSurround™  
by SRS**

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## WARNINGS AND CAUTIONS

### CAUTION

Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield, or carbon painted on the CRT, after removing the anode.

### WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the AC power line.



### SAFETY-RELATED COMPONENT WARNING!!

Components identified by shading and  mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

---

### ATTENTION!!

Apres avoir deconnecte le cap de l'anode, court-circuiter l'anode du tube cathodique et celui de l'anode du cap au chassis metallique de l'appareil, ou la couche de carbone peinte sur le tube cathodique ou au blindage du tube cathodique.

Afin d'éviter tout risque d'électrocution provenant d'un châssis sous tension, un transformateur d'isolation doit être utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.



### ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

Les composants identifiés par une trame et par une marque  sur les schémas de principe, les vues exploseres et les listes de pièces sont d'une importance critique pour la sécurité du fonctionnement. Ne les remplacer que par des composants Sony dont le numéro de pièce est indiqué dans le présent manuel ou dans des suppléments publiés par Sony. Les réglages de circuit dont l'importance est critique pour la sécurité du fonctionnement sont identifiés dans le présent manuel. Suivre ces procédures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or touching high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
8. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### Leakage Test

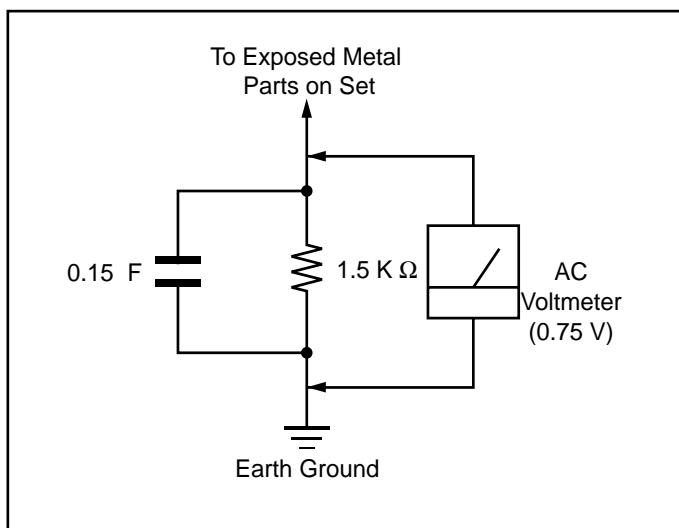


Figure A. Using an AC voltmeter to check AC leakage.

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instructions.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson's 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

### How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble-light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

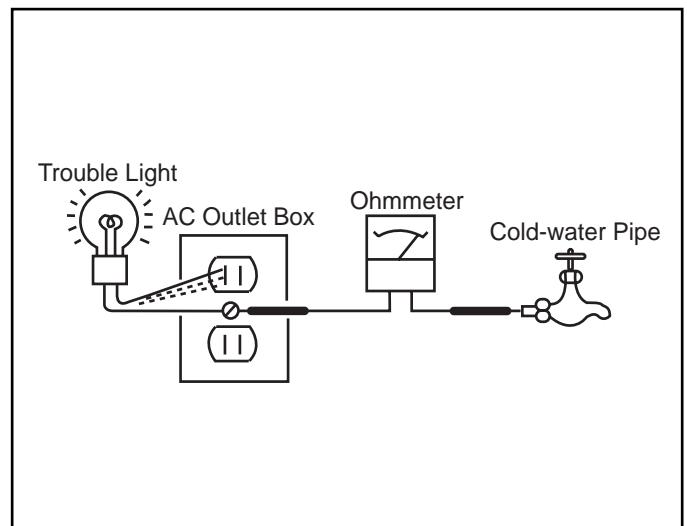


Figure B. Checking for earth ground.

## SELF-DIAGNOSTIC FUNCTION



The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the Remote Commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

### Diagnostic Test Indicators

When an error occurs, the STANDBY/TIMER LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.

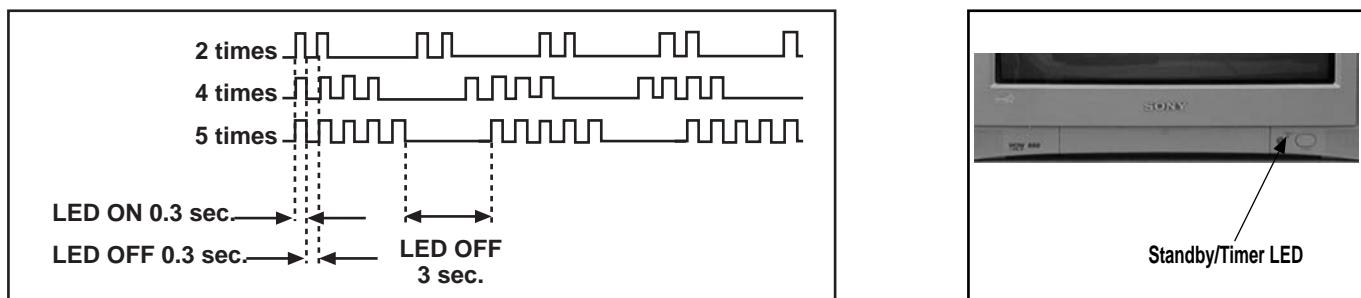
Results for all of the following diagnostic items are displayed on screen. No error has occurred if the screen displays a "0".

Diagnostic Item Description	No. of times STANDBY/ TIMER lamp flashes	Self-Diagnostic Display/ Diagnostic Result	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	—	<ul style="list-style-type: none"> <li>Power cord is not plugged in.</li> <li>Fuse is burned out (F601). (A Board)</li> </ul>	<ul style="list-style-type: none"> <li>Power does not come on.</li> <li>No power is supplied to the TV.</li> <li>AC Power supply is faulty.</li> </ul>
+B overcurrent (OCP)*	2 times	2:0 or 2:1	<ul style="list-style-type: none"> <li>H.OUT (Q505) is shorted. (A Board)</li> <li>IC2751 is shorted. (CW Board)</li> </ul>	<ul style="list-style-type: none"> <li>Power does not come on.</li> <li>Load on power line is shorted.</li> </ul>
I-Prot	4 times	4:0 or 4:1	<ul style="list-style-type: none"> <li>+13V is not supplied. (A Board)</li> <li>IC545 is faulty. (A Board)</li> </ul>	<ul style="list-style-type: none"> <li>Has entered standby state after horizontal raster.</li> <li>Vertical deflection pulse is stopped.</li> <li>Power line is shorted or power supply is stopped.</li> </ul>
IK (AKB)	5 times	5:0 or 5:1	<ul style="list-style-type: none"> <li>IC001 is faulty. (A Board)</li> <li>Screen (G2) is improperly adjusted.**</li> </ul>	<ul style="list-style-type: none"> <li>No raster is generated.</li> <li>CRT Cathode current detection reference pulse output is small.</li> </ul>

\*If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the microcontroller is displayed on the screen.

\*\*Refer to Screen (G2) Adjustments in Section 2-4. of this manual.

### Display of Standby/Timer LED Flash Count



#### Diagnostic Item

+B Overcurrent  
I-Prot  
IK (AKB)

#### Flash Count\*

2 times  
4 times  
5 times

\*One flash count is not used for self-diagnostic.

### Stopping the Standby/Timer LED Flash

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER LAMP from flashing.

## Self-Diagnostic Screen Display

For errors with symptoms such as "power sometimes shuts off" or "screen sometimes goes out" that cannot be confirmed, it is possible to bring up past occurrences of failure on the screen for confirmation.

### To Bring Up Screen Test

In standby mode, press buttons on the Remote Commander sequentially, in rapid succession, as shown below:

Display → Channel 5 → Sound Volume □ → Power ON

↑ Note that this differs from entering the Service Mode (Sound Volume □).

## Self-Diagnostic Screen Display

SELF DIAGNOSTIC	
2: +B OCP	0
3: +B OVP	N/A
4: VSTOP	0
5: AKB	1
101: WDT	N/A

Numeral "0" means that no fault was detected.  
Numeral "1" means a fault was detected one time only.

### Handling of Self-Diagnostic Screen Display

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to "0".

Unless the result display is cleared to "0", the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

### Clearing the Result Display

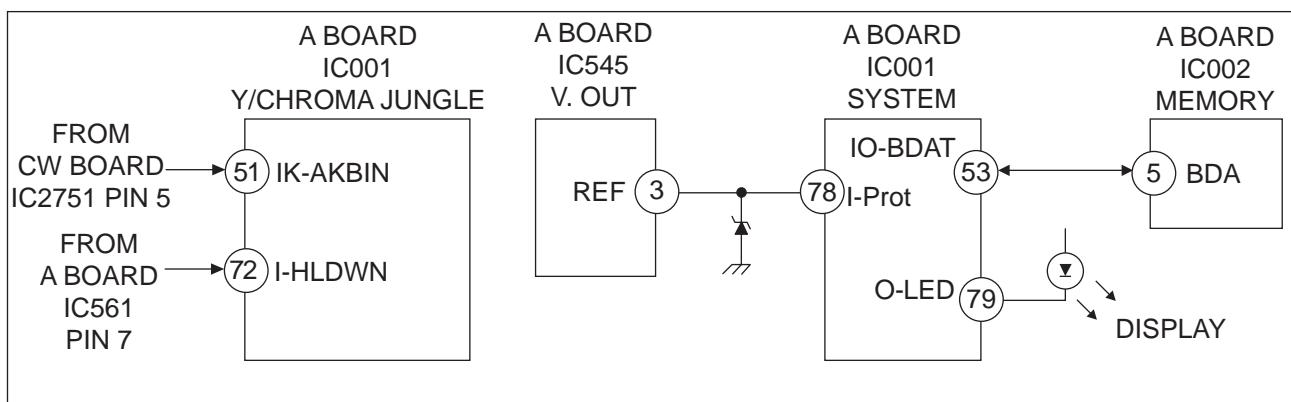
To clear the result display to "0", press buttons on the Remote Commander sequentially when the diagnostic screen is displayed, as shown below:

Channel 8 → ENTER

### Quitting the Self-Diagnostic Screen

To quit the entire self-diagnostic screen, turn off the power switch on the Remote Commander or the main unit.

## Self-Diagnostic Circuit



### +B overcurrent (OCP)

Occurs when an overcurrent on the +B (135V) line is detected by pin 72 of IC001 (A Board). If the voltage of pin 72 of IC001 (A Board) is less than 1V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

### I-Prot

Occurs when an absence of the vertical deflection pulse is detected by pin 78 of IC001 (A Board). Power supply will shut down when waveform interval exceeds 2 seconds.

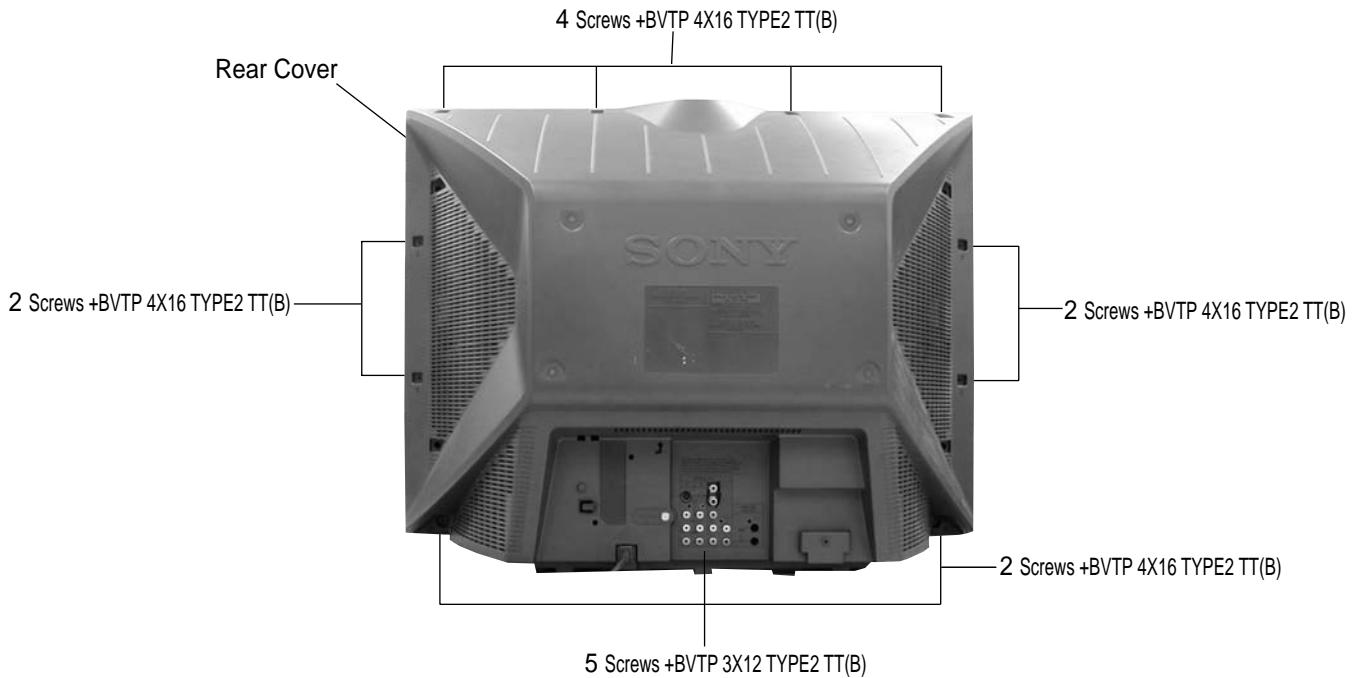
### IK (AKB)

If the RGB levels\* do not balance within 2 seconds after the power is turned on, this error will be detected by IC001 (A Board). TV will stay on, but there will be no picture.

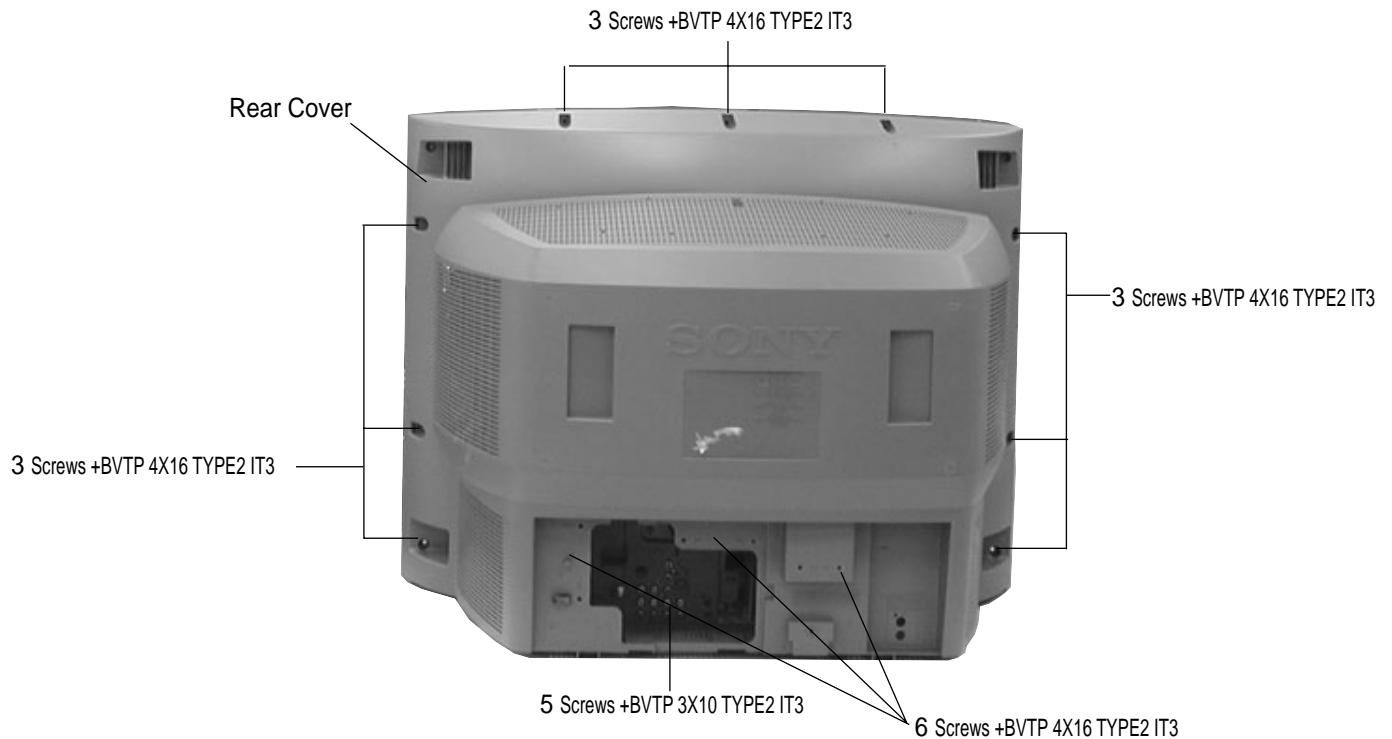
\*(Refers to the RGB levels of the AKB detection Ref pulse that detects 1K).

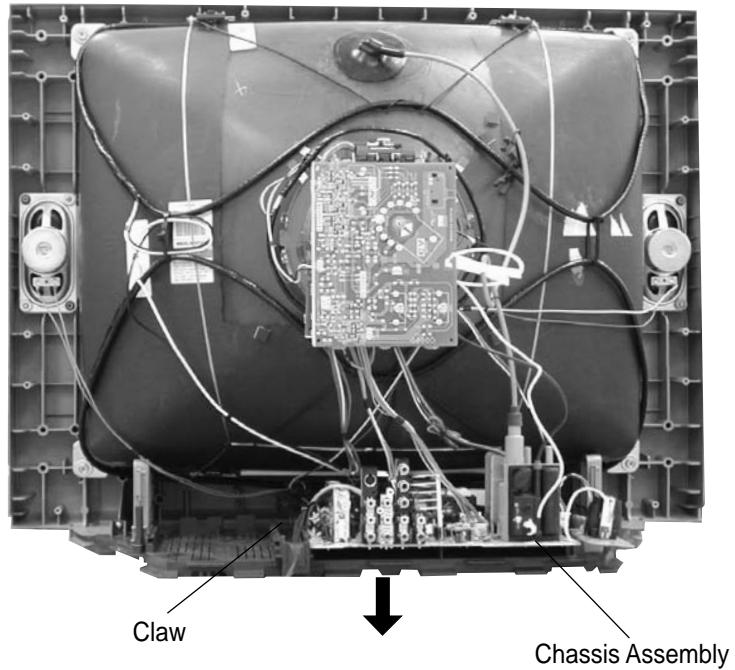
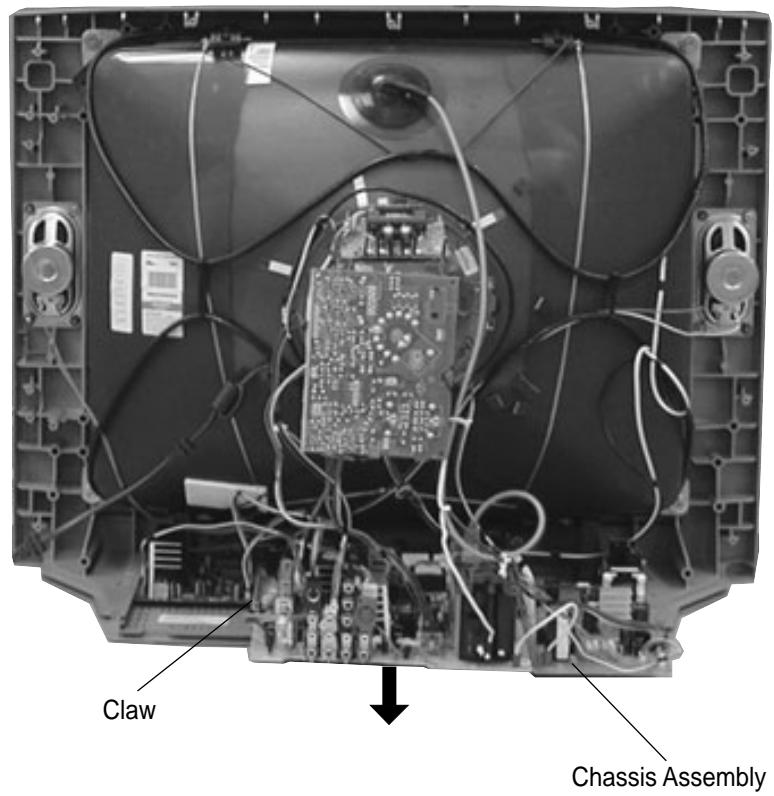
## SECTION 1: DISASSEMBLY

### 1-1. REAR COVER REMOVAL (ALL EXCEPT KV-27FA310/29FA310)



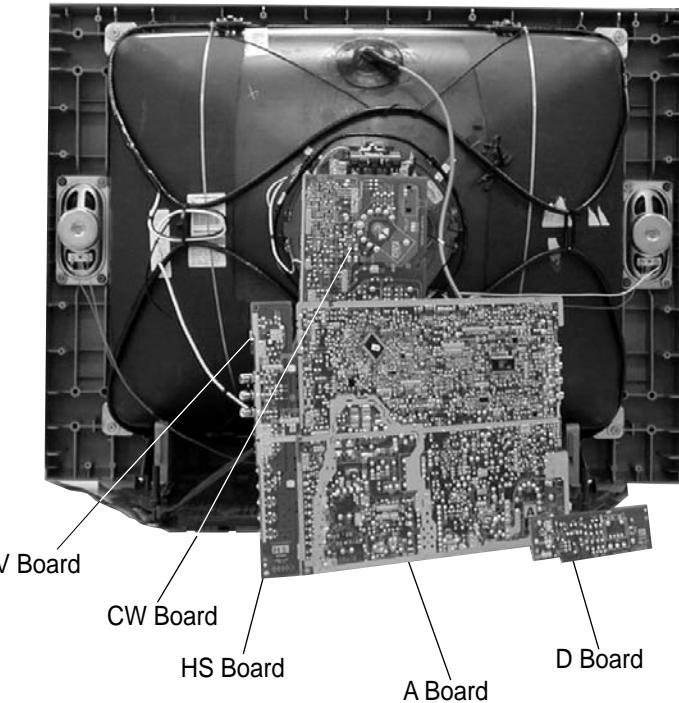
### 1-2. REAR COVER REMOVAL (KV-27FA310/29FA310 ONLY)



**1-3. CHASSIS ASSEMBLY REMOVAL (ALL EXCEPT KV-27FA310/29FA310)****1-4. CHASSIS ASSEMBLY REMOVAL (KV-27FA310/29FA310 ONLY)**

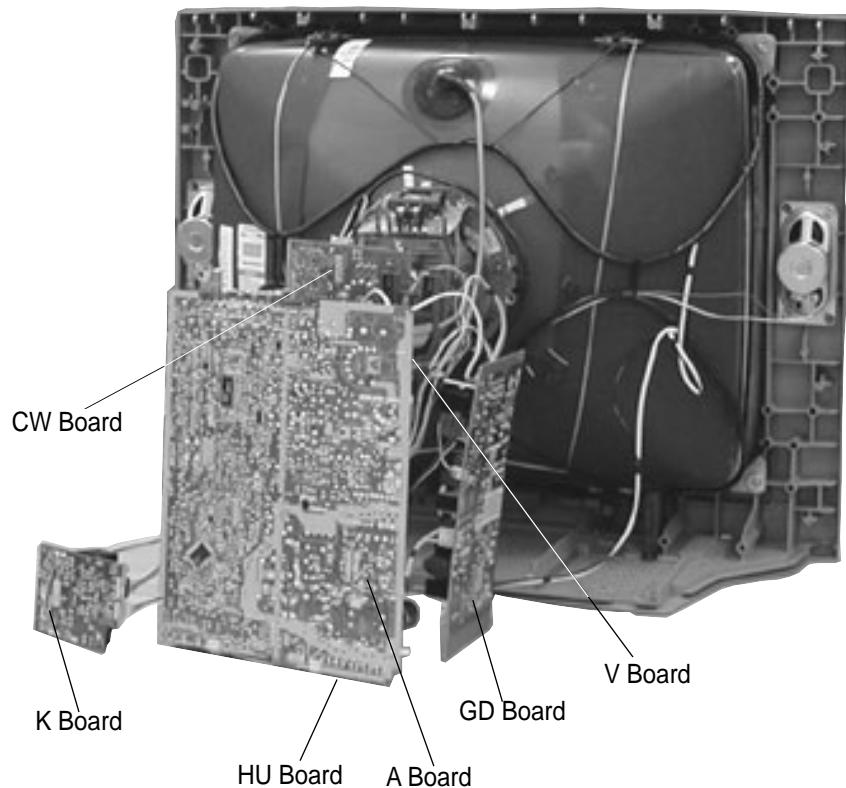
## 1-5. SERVICE POSITION (ALL EXCEPT KV-27FA310/29FA310)

- ① Press on catch tab to release A Board.
- ② Disconnect cables as needed to allow A Board to be removed.



## 1-6. SERVICE POSITION (KV-27FA310/29FA310 ONLY)

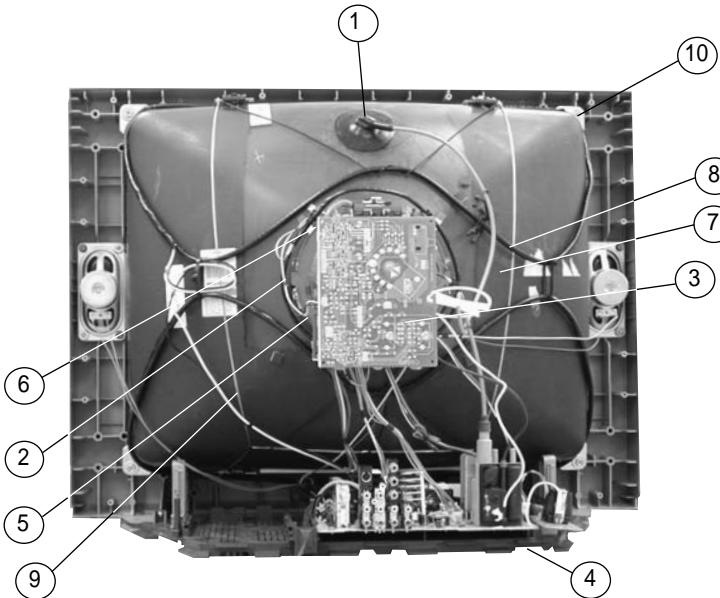
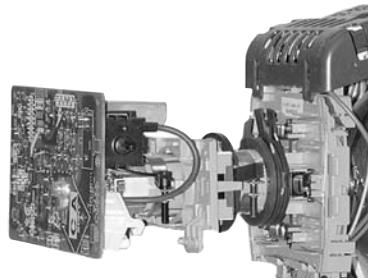
- ① Press on catch tab to release A Board.
- ② Disconnect cables as needed to allow A Board to be removed.



## 1-7. PICTURE TUBE REMOVAL

### WARNING: BEFORE REMOVING THE ANODE CAP

High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.



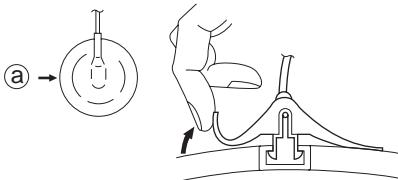
1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CW Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tension devices.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

## ANODE CAP REMOVAL PROCEDURE

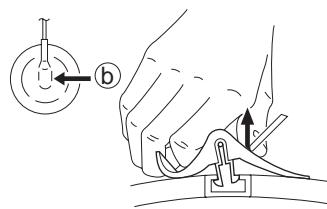
**WARNING:** High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT **before** attempting to remove the anode cap. Short between anode and coated earth ground strap of CRT.

**NOTE:** After removing the anode cap, short circuit the anode of the picture tube and the anode cap to either the metal chassis, CRT shield, or carbon painted on the CRT.

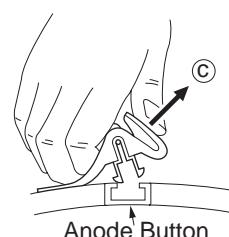
### REMOVAL PROCEDURES



Turn up one side of the rubber cap in the direction indicated by arrow (a) .



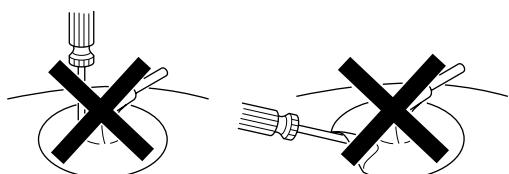
Use your thumb to pull the rubber cap firmly in the direction indicated by arrow (b) .



When one side of the rubber cap separates from the anode button, the anode cap can be removed by turning the rubber cap and pulling it in the direction of arrow (c) .

### HOW TO HANDLE AN ANODE CAP

1. Do not use sharp objects which may cause damage to the surface of the anode cap.
2. To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
3. Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



## SECTION 2: SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Set the controls as follows unless otherwise noted:

VIDEO MODE: Pro

PICTURE CONTROL: Normal

BRIGHTNESS CONTROL: Normal

**Perform the adjustments in order as follows:**

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2)
5. White Balance

**Note Test Equipment Required:**

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

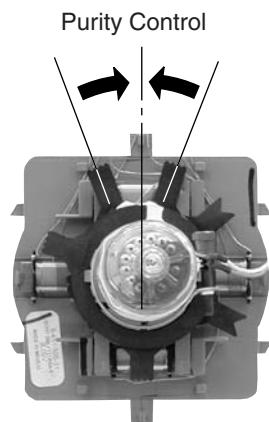
### 2-1. BEAM LANDING

Before beginning adjustment procedure:

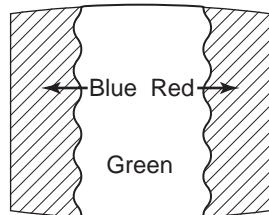
1. Feed in the white pattern signal.

#### Adjustment Procedure

1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown below:

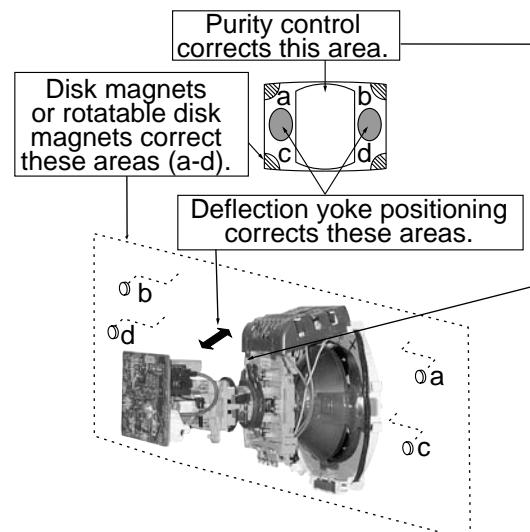
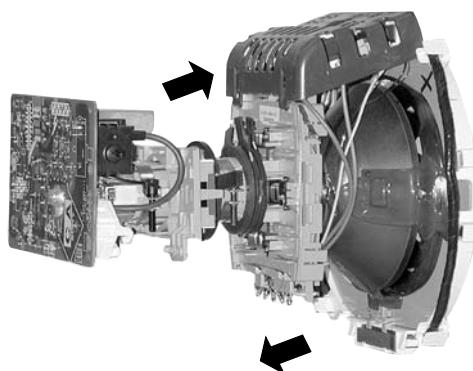


3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are even on both sides.



5. Move the deflection yoke forward, and adjust so that the entire screen becomes green.

6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. If landing at the corner is not right, adjust by using the disk magnets.



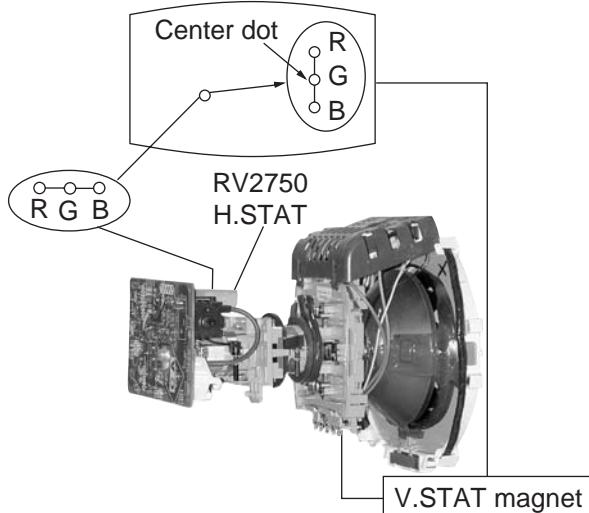
## 2-2. CONVERGENCE

Before starting convergence adjustments:

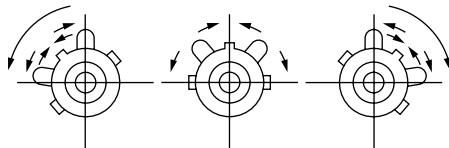
- 1 Perform FOCUS, VLIN and VSIZE adjustments.
2. Set BRIGHTNESS control to minimum.
3. Feed in dot pattern.

### Vertical Static Convergence

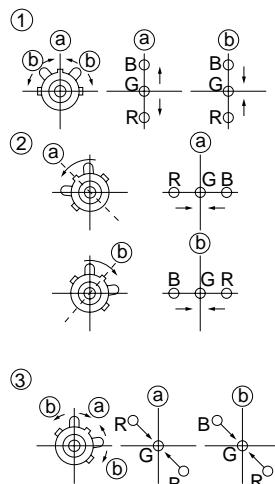
1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen.



2. Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



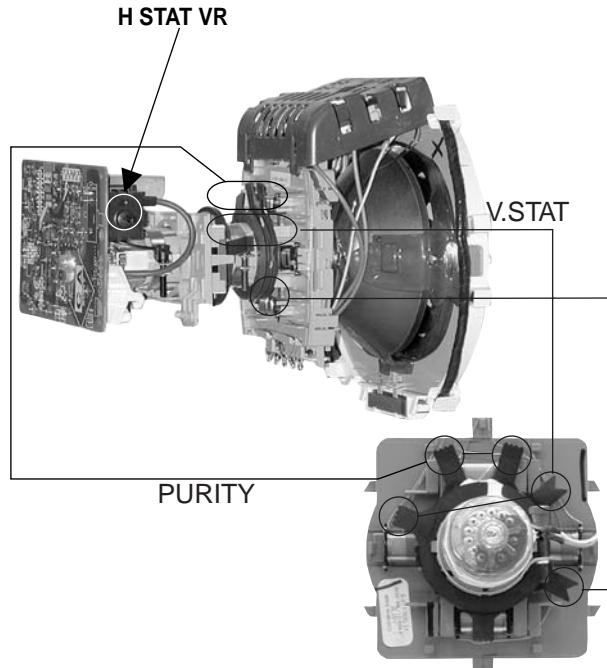
When the V. STAT magnet is moved in the direction of arrow a and b, red, green, and blue dots move as shown below:



### Horizontal Static Convergence

If the blue dot does not converge with the red and green dots, perform the following:

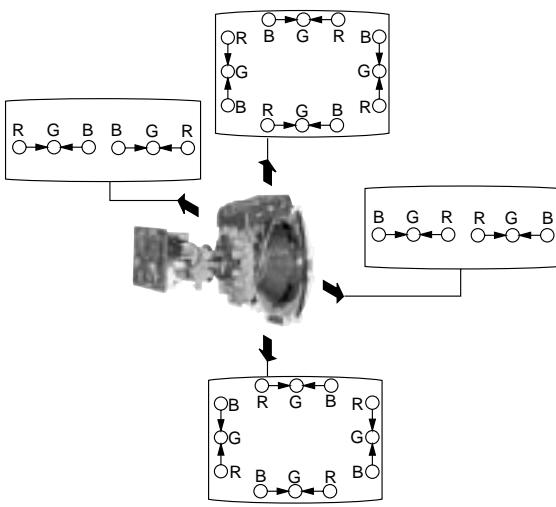
1. Move H STAT VR magnet (a) to correct insufficient H.Static convergence.



## Dynamic Convergence Adjustment

Before performing this adjustment, perform Horizontal and Vertical Static Convergence Adjustment.

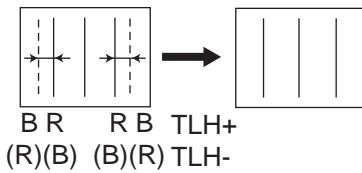
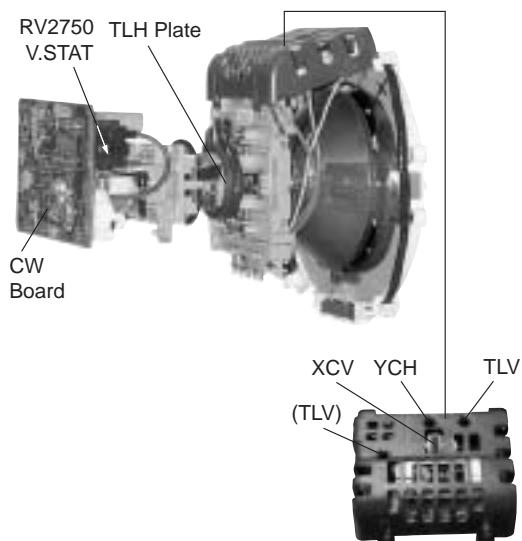
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below:



4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

## TLH Plate Adjustment

1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3. Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.

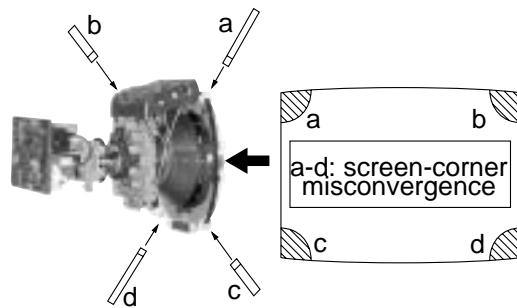


4. Adjust XCV core to balance X axis.
5. Adjust YCH VR to balance Y axis.
6. Adjust vertical red and blue convergence with V.TILT (TLV VR.).

Note: Perform adjustment 3-6 while tracking items 1 and 2.

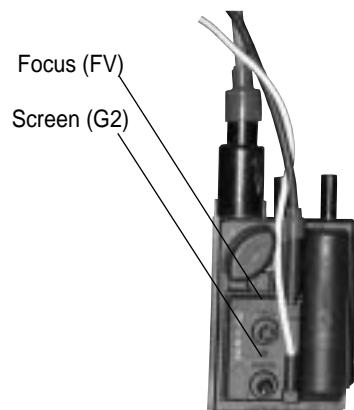
## Screen-Corner Convergence

1. Affix a permalloy assembly corresponding to the misconverged areas:



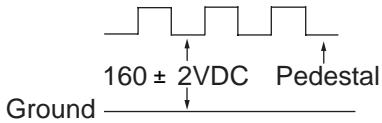
## 2-3. FOCUS

1. Adjust FOCUS control for best pictures.



## 2-4. SCREEN (G2)

1. Input a dot pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are  $160 \pm 2\text{VDC}$ .



4. Observe the screen and adjust SCREEN (G2) VR in FBT to obtain the faintly visible background of dot signal.

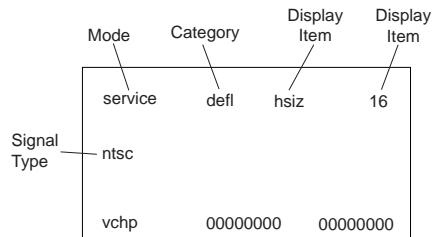
## 2-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

### Service Mode Procedure

1. Standby mode (power off).
2. Press [Display] → Channel [5] → Sound Volume [+] → Power on the Remote Commander (press each button within a second).

### Service Adjustment Mode On

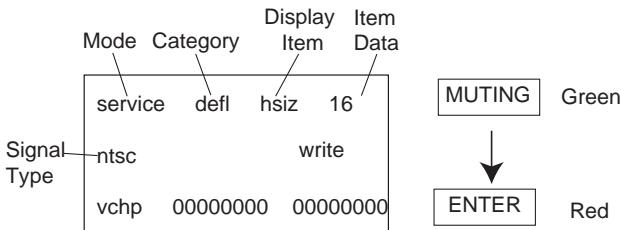
1. The CRT displays the time being adjusted.



2. Press [1] or [4] on the Remote Commander to select the time.
3. Press [3] or [6] on the Remote Commander to change the data.
4. Press [MUTING] then [ENTER] to save into the memory.

### Service Adjustment Mode Memory

Turn the set off then on to exit Service Adjustment Mode.



## 2-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Adjust with SBRT if necessary.
5. Select GCUT and BCUT with [1] and [4].
6. Adjust with [3] and [6] for the best white balance.
7. Set the PICTURE and BRIGHTNESS to maximum.
8. Select GDRV and BDRV with [1] and [4].
9. Adjust with [3] and [6] for the best white balance.
10. Press [MUTING] then [ENTER] to save into the memory.

## SECTION 3: SAFETY RELATED ADJUSTMENTS

### 3-1. **█ R564 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS**

The following adjustments should always be performed when replacing the following components which are marked with █ on the schematic diagram:

Part Replaced (█)	Adjustment (█)
DY, T585, CRT, IC001, IC561, IC600, IC604, C506, C507, C508, C510, C511, C513, C514, L588, D566, D567, D568, PH602, R526, R564, R565, R566, R851, T510, T511.....A Board	HV HOLD-DOWN R564

#### Preparation Before Confirmation

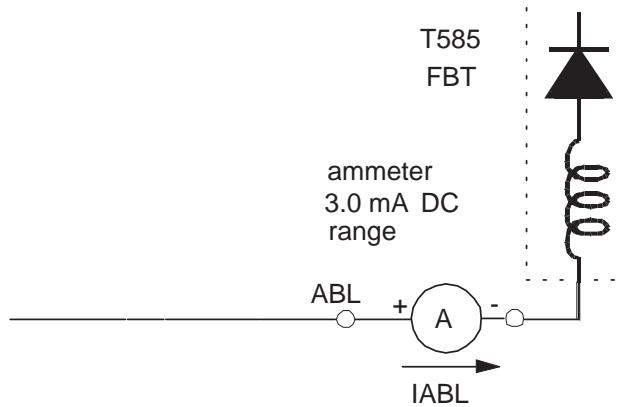
1. Using a Variac, apply AC input voltage:  $120 \pm 2$  VAC.
2. Turn the POWER switch ON.
3. Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
4. Confirm that the voltage between C566 (+) or TP30 and ground is more than 99VDC.

#### Hold-Down Operation Confirmation

1. Connect the current meter between Pin 11 of the FBT (T585) and the PWB land where Pin 11 would normally attach (See Figure 1 on the next page).
2. Input a dot signal and adjust the ABL current to follow with the PICTURE and BRIGHTNESS control:  $IABL = 140 \pm 100\mu A$ .
3. Confirm the voltage of A Board TP-23 is  $135.6 \pm 1.0$  VDC.
4. Connect the digital voltmeter and the DC power supply via Diode 1SS119 to C566 (+) and ground (See Figure 1 on next page).
5. Increase the DC power voltage gradually until the picture blinks out.
6. Turn DC power source off immediately.
7. Read the digital voltmeter indication (Standard  $\leq 114.6$  +0VDC/-0.3DC).
8. Input 100 IRE White Signal and adjust the ABL current to follow with the PICTURE and BRIGHTNESS control:  $IABL = 1820\mu A \pm 200\mu A$ .
9. Repeat steps 4 through 7.

#### Hold-Down Readjustment

If the setting indicated in Step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R564 component marked with █.



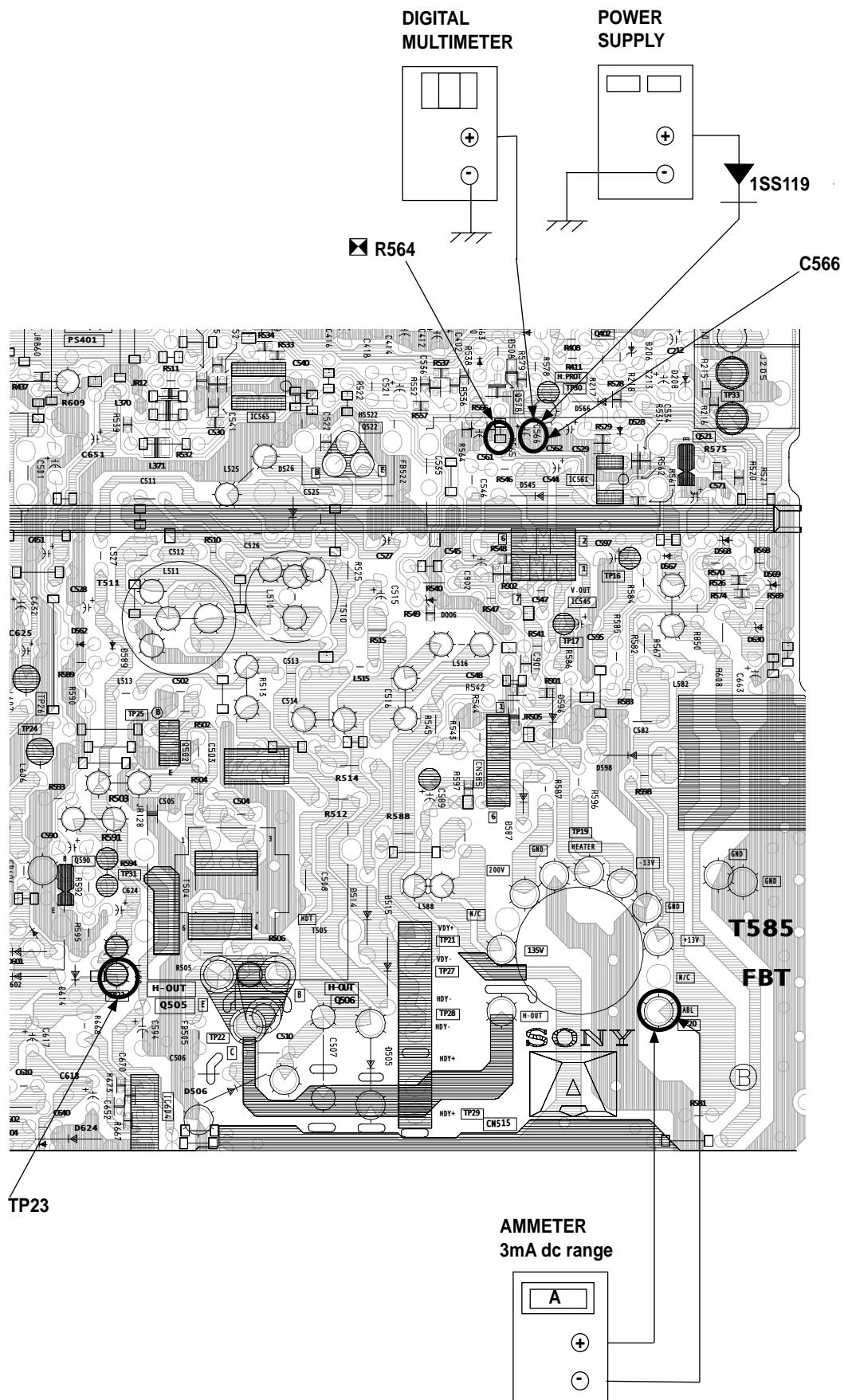
### 3-2. **B+ VOLTAGE CONFIRMATION AND ADJUSTMENT**

Note: The following adjustments should always be performed when replacing the following components, which are marked with █ on the schematic diagram on the A Board:

**A BOARD:** █ IC604, PH602

1. Using a Variac, apply AC input voltage:  $130 + 2.0 / - 0.0$  VAC.
2. Input a DOT pattern at Q.C.
3. Set the PICTURE and the BRIGHTNESS controls to minimum.
4. Confirm the voltage of A Board between TP-23 & Ground is  $=135.6 \pm 1$  VDC.
5. If step 4 is not satisfied, replace the components listed above, then repeat steps 1 through 3.

## FIGURE 1



## SECTION 4: CIRCUIT ADJUSTMENTS

### Electrical Adjustments by Remote Commander

Use the Remote Commander (RM-Y180, RM-Y195) to perform the circuit adjustments in this section.

**Test Equipment Required:** 1. Pattern generator 2. Frequency counter 3. Digital multimeter 4. Audio oscillator

#### 4-1. SETTING THE SERVICE ADJUSTMENT MODE

1. Standby mode (Power off).
2. Press the following buttons on the remote commander within a second of each other:  
[Display] → Channel [5] → Sound Volume [+] → Power

#### Service Adjustment Mode On

1. The CRT displays the item being adjusted.

Category	Signal Type	Display Item #	Item Data
DEF	NTSC	1	NVM OK
Display Item			M65582AMF-101FPZ0

2. Press [1] or [4] on the Remote Commander to select the item.
3. Press [3] or [6] on the Remote Commander to change the data.
4. Press [MUTING] then [ENTER] to write into memory.

#### Service Adjustment Mode Memory

Mode	Category	Display Item	Item Data
service	defl	hsiz	16
Signal Type	ntsc		write
vchp	00000000	00000000	

1. Press [8] then [ENTER] on the Remote Commander to initialize.

Mode	Category	Display Item	Item Data
service	defl	hsiz	16
Signal Type	ntsc		write
vchp	00000000	00000000	

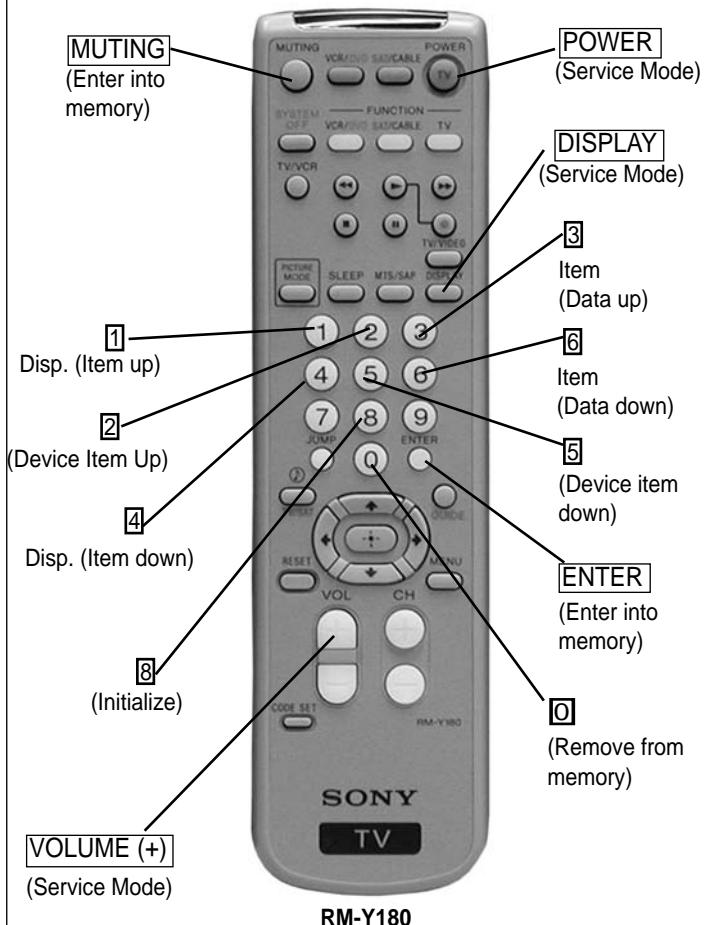
Carry out Step 1 when adjusting IDs 0-7 and when replacing and adjusting IC002

2. Press [MUTING] then [ENTER] to write into memory.
3. Turn set off then on to exit Service Adjustment Mode.

#### 4-2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, pull out the plug from the AC outlet, then replace the plug in the AC outlet again.
2. Turn the power switch ON and set to Service Mode.
3. Call the adjusted items again to confirm they were adjusted.

#### 4-3. REMOTE ADJUSTMENT BUTTONS AND INDICATORS



#### 4-4. SERVICE DATA LISTS

Service Group	Fix/Var	No.	Name	Description	NTSC Init Data
VERSION	Fix	0	VER	Microprocessor version information	=
DEF	VAR	1	HSIZ	H-SIZE ( EW DC : YUV OFFSET )	47
	VAR	2	HPOS	H POSITION: YUV OFFSET	36
	VAR	3	VSIZ	V RAMP SIZE: YUV OFFSET	28
	VAR	4	VPOS	V POSITION (RAMP DC) NOT USEFUL: YUV OFFSET	37
	VAR	5	VLIN	V LINEARITY	32
	VAR	6	SCOR	S CORRECTION	49
	VAR	7	VBOW	BOW	31
	VAR	8	VANG	ANGLE	37
	VAR	9	TRAP	EW TRAPESIUM	24
	VAR	10	PAMP	PARABOLA ( EW PIN )	49
	VAR	11	UPIN	UPPER CORNER ( UPPER PIN )	31
	VAR	12	LPIN	LOWER CORNER ( LOWER PIN )	30
	VAR	13	TROT	TROT	109
	VAR	14	HBLK	FBPBLK ( H BLK MODE SELECT )	0
	VAR	15	RBLK	HBLK R POS ( HBLK REAR TIMING: YUV OFFSET )	15
	VAR	16	LBLK	HBLK F POS ( HBLK FRONT TIMING: YUV OFFSET )	41
	FIX	17	VBLK	VBLK POS ( V BLK WIDTH )	0
	FIX	18	HMSK	Macro OFF ( TOP VEND [ WHEN MACROVISION ] PREVENT OFF )	0
	FIX	19	HDW	IIC_HOUT_DUTY ( H PULSE WIDTH [ 25u/19u ] )	1
	FIX	20	AFC	H AFC Gain ( AFC GAIN )	0
	FIX	21	AFC1	H Charge pump ( AFC1 TIME CONSTANT )	3
	FIX	22	AFCW	AFC1 PULLIN ( AFC1 PULL IN WIDE )	0
	FIX	23	CDMD	V CD MODE ( V DET WINDOW SW TIMING )	1
	FIX	24	HSS	SYNC SLICE LVL(H) ( SYNC SLICE LEVEL [ H sepa ] )	0
	FIX	25	VSS	SYNC SLICE LVL(L) ( SYNC SLICE LEVEL [ V sepa ] )	3
	FIX	26	SLDN	AUTO SLICE DOWN ( AUTO SLICE LEVEL DOWN )	0
	FIX	27	SLUP	AUTO SLICE UP ( AUTO SLICE LEVEL UP )	0
	FIX	28	JPSW	VJPSW ( JUMP SW )	0
	FIX	29	HOSC	H VCO FOR OFFSET ADJUST OFFSET	7
	FIX	30	EHT	EHT	4
	FIX	31	EHTG	EHT GAIN ( EHT MODE )	1

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
16:9	VAR	1	VSIZ	V RAMP SIZE	48
	VAR	2	VPOS	V POSITION ( RAMP DC )	40
	VAR	3	VLIN	V LINEARITY	26
	VAR	4	SCOR	S CORRECTION	24
	VAR	5	TRAP	EW TRAPESIUM	22
	VAR	6	PAMP	PARABOLA ( EW PIN )	24
	VAR	7	UPIN	UPPER CORNER ( UPPER PIN )	31
	VAR	8	LPIN	LOWER CORNER ( LOWER PIN )	31
	VAR	9	ABLG	ABL GAIN	15
	VAR	10	SCON	SUB CONTRAST LEVEL	13
	VAR	11	VPW	JUMP PULSE WIDTH	1

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data	Video	YUV	16:09
VP1	VAR	1	RDRV	R DRIVE	64	64	64	N/A
	VAR	2	GDRV	G DRIVE: GDOF OFFSET ( only Color Temp. "Warm")	45	45	48	N/A
	VAR	3	BDRV	B DRIVE: BDOF OFFSET ( only Color Temp. "Warm")	45	45	44	N/A
	VAR	4	RCUT	HARDWARE AKB (R) CMP DATA	120	120	120	N/A
	VAR	5	GCUT	HARDWARE AKB (G) CMP DATA	91	91	90	N/A
	VAR	6	BCUT	HARDWARE AKB (B) CMP DATA	87	87	105	N/A
	VAR	7	SCON	SUB CONTRAST LEVEL	19	19	19	N/A
	VAR	8	SHUE	SUB TINT (HUE)	7	7	7	N/A
	VAR	9	SCOL	SUB COLOR LEVEL	14	14	24	N/A
	VAR	10	SBRT	SUB BRIGHTNESS	13	13	15	N/A
	FIX	11	RON	R OUTPUT ON ( 0:R OUTPUT OFF 1:R OUTPUT ON )	1			
	FIX	12	GON	G OUTPUT ON ( 0:R OUTPUT OFF 1:R OUTPUT ON )	1			
	FIX	13	BON	B OUTPUT ON ( 0:R OUTPUT OFF 1:R OUTPUT ON )	1			
	FIX	14	BLLV	BLUE STRETCH ( 00:NO<->11:DEEP ) only Color Temp "Cool"	1			
	FIX	15	MTRX	MATRIX RATIO SELECT	0			
	FIX	16	AXIS	R-Y PHASE SELECT	52			
	VAR	17	SSHO	SUB SHARPNESS GAIN (OVER) RF/VIDEO	10	25	25	N/A
	VAR	18	SSHP	SUB SHARPNESS GAIN (PRE) RF/VIDEO	15	30	30	N/A
	VAR	19	SHPF	SHARPNESS FOR ( 00:2 CLK <-> 11:5 CLK )	1	0	0	N/A
	FIX	20	SHCL	SHARPNESS CORING LEVEL	0			
	FIX	21	SHMX	SHARPNESS LIMITER LEVEL	15			
	FIX	22	ACLV	ACL GAIN	0			
	FIX	23	AKBD	AKB SELF DIAGNOSTIC COUNTER (@1 SEC)	2			
	FIX	24	AKBS	AKB SWITCH ( 0:AKB OFF 1:H/W AKB ON )	1			
	FIX	25	REFP	AKB REFPLS TIMING	0			
	FIX	26	YNRC	YNR LIMITER LEVEL	15			
	FIX	27	BKON	BLACK STRETCH ON	1			
	FIX	28	BKAT	BLACK STRETCH DETECTOR TIME CONSTANT1	15			
	FIX	29	BKRC	BLACK STRETCH DETECTOR TIME CONSTANT2	4			
	FIX	30	BKDP	BLACK STRETCH DEPTH	soft cont'l			
	FIX	31	BKSP	BLKSTPNT BLACK STRETCH POINT		2		

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data	Video	YUV	16:09
VP2	FIX	1	VMOF	VM GAIN(Off) ( VM LEVEL AT "OFF" SETTING )	2			
	FIX	2	VMLO	VM GAIN(Low) ( VM LEVEL AT "LOW" SETTING )	4			
	FIX	3	VMHI	VM GAIN(High) ( VM LEVEL AT "HIGH" SETTING )	7			
	FIX	4	VMDL	VM DELAY ( VM DELAY )	6			
	FIX	5	VMPL	VM POL ( VM POLARITY )	0			
	FIX	6	VMWD	VM WIDTH ( VM WIDTH )	0			
	FIX	7	VMCL	VM CORING LEVEL ( VM CORING LEVEL )	0			
	FIX	8	VMMX	VM MAX ( VM LIMITER LEVEL )	15			
	FIX	9	CKLV	KILLER LEVEL ( VM COLOR KILLER VTH )	1			
	FIX	10	CKON	FORCE KILLER ( FORCE KILLER )	0			
	FIX	11	ALFA	ALFA ( ADAPTIVE DET SENSITIVITY )	2			
	FIX	12	YCMD	MANEXP ( YC SEPA FORCE SELECT [ 00:ADAPTIVE 01:H 10:V 11:HV ] )	0			
	FIX	13	VACL	V APERTURE CORING LV ( V APERTURE CORING LEVEL )	0			
	FIX	14	VAGA	V APERTURE GAIN ( V APERTURE GAIN LEVEL )	soft cont'l			
	FIX	15	VAMX	V APERTURE MAX GAIN ( V APERTURE LIMITER LEVEL )	5			
	FIX	16	GAMM	GAMMA ( GAMMA [ 00:NO <-> 11:DEEP ] )	soft cont'l			
	FIX	17	YDLY	Y DELAY ( Y DELAY TIME )	1			
	FIX	18	CDLY	C DELAY ( C DELAY TIME )	0			
	FIX	19	YOFF	Y Mute ( Y OUTPUT MUTE )	0			
	FIX	20	CBPF	SAW FILTER(7.2MHzBPF) ( C BPF FOR HI )	0			
	FIX	21	BGPP	BGP POS ( BGP [ FOR C DECODER ] TIMING )	9			
	VAR	22	GDOF	G DRIVE OFFSET only Color Temp. "Warm"	9			
	VAR	23	BDOF	B DRIVE OFFSET only Color Temp. "Warm"	14			
	VAR	24	GCOF	G CUT CMP DATA OFFSET only Color Temp. "Warm"	11			
	VAR	25	BCOF	B CUT CMP DATA OFFSET only Color Temp. "Warm"	28			
	VAR	26	DCTV	DCTRAN VTH<6:0> ( DCTRANSFER VTH )	30			
	FIX	27	DCTG	DCTRAN GAIN<4:0> ( DCTRANSFER GAIN )	soft cont'l			

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
NP	VAR	1	SCOL	SUB COLOR LEVEL	14
	VAR	2	SHCL	SHARPNESS CORING LEVEL	15
	VAR	3	SHMX	SHARPNESS LIMITER LEVEL	7
	FIX	4	YNRC	YNR LIMITER LEVEL	7
	FIX	5	VMHI	VM LEVEL AT " HIGH " SETTING	10
	FIX	6	VMCL	VM CORING LEVEL	0
	FIX	7	VMMX	VM LIMITER LEVEL	7
	FIX	8	VAMX	V APERTURE LIMITER LEVEL	0
	FIX	9	GAMM	GAMMA ( 00: NO < - > 11:DEEP)	0
	FIX	10	YNRS	YNR ON	1
	FIX	11	WSTH	WEAK SIGNAL VTH	7
	FIX	12	WSVA	WEAK SIGNAL VIDEO ATT	0
	FIX	13	WSCA	WEAK SIGNAL CHROMA ATT	5
	FIX	14	NRCH	THRNZV1( NOISE DET TIME CONSTANT )	0
	FIX	15	NRCL	THRNZV2 ( NOISE DET TIME CONSTANT )	16
	FIX	16	NRVL	THRNZH1 ( NOISE DET VTH )	2
	FIX	17	NRVH	THRNZH2 ( NOISE DET VTH )	0
	FIX	18	IPNC	DETNZ STATUS COUNTER	2
	FIX	19	IPNV	DETECTION PERIOD	10

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC BA6 DATA (DEC)			
					PALLET = VIVID	PALLET = STD	PALLET = MOVIE	PALLET = PRO
PALLET	FIX	1	VPIC	PICTURE	63	50	37	31
	FIX	2	VBRI	BRIGHTNESS	27	30	31	31
	FIX	3	VCOL	COLOR	37	32	31	31
	FIX	4	VHUE	HUE	31	31	31	31
	FIX	5	VSHA	SHARPNESS	31	32	31	21
	FIX	6	VVM	VM	2	1	0	0
	FIX	7	VTRI	COLOR TEMP	0	1	2	1
	FIX	8	VAPA	APERTURE G	5	5	3	0
	FIX	9	VGMA	GAMMA	3	1	0	0
	FIX	10	VDCT	DCT LV	23	15	2	2
	FIX	11	VBKP	BLACK STRETCH DEPTH ( VIDEO )	3	3	4	7
	FIX	12	TBKD	BLACK STRETCH DEPTH ( TUNER )	3	3	4	7

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
>	FIX 1	1	YNRS	YNR SW ( YNR ON )	0
	FIX 2	2	YTHR	Y THR 2D ( Y SIGNAL THROUGH 2DYCS )	0
	FIX 3	3	Y2D	Y2D Fix ( Y SIGNAL GENERATE from 2DYCS )	0
	FIX 4	2DFX		C BPF Fix ( C SIGNAL GENERATE from H/V BPF only )	1
	FIX 5	CLPS		CLAMP CONTROL SW ( 0: CLAMP OFF. 1: CLAMP AUTO. 2: CLAMP ON )	1
	FIX 6	VLPF		VIDEO LPF ( Y_LPF [ ANALOG ] for adjust )	3
	FIX 7	CLPF		CHROMA LPF ( C_LPF [ ANALOG ] for adjust )	3
	FIX 8	BPFB		YCS HBPF BACK ( YCS HBPF SELECT [ BACK ] )	1
	FIX 9	BPFF		YCS HBPF FRONT ( YCS HBPF SELECT [ FRONT ] )	1
	FIX 10	BKTS		BS T2 IFON ( BLACK STRETCH RECOVER TIME OUT )	0
	FIX 11	VMG <sub>2</sub>		VMGAIN <sub>2</sub> ( MODULATOR FEEDBACK GAIN CONTROL )	3
	FIX 12	CLPT		CLAMP KEEP TIMER ( CLAMP AUTO ON KEEP TIMER COUNT [ @ 100 MS ] )	15

Service Group	Fix/Var	No.	Name	Item name & ( Description )	A8 Init Data	Video	YUV	16:09
C	FIX 1	1	A1FL	AMP OFF1 L ( ANALOG ACC hysteresis )	90			
	FIX 2	2	A1ON	AMP ON ( ANALOG ACC AMP ON LEVEL )	4			
	FIX 3	3	ACCS	ACC SW ( ACC ON/OFF )	0	0	1	N/A
	FIX 4	4	AASL	AVE SEL ( C DECODER TIME CONSTANT [32, 16, 8, 1H] )	2			
	FIX 5	5	BASL	B2AVE SEL ( ACC TIME CONSTANT )	0			
	FIX 6	6	XFFR	FREE RUN ( VCXO FORCE FREERUN )	0	0	1	N/A
	FIX 7	7	A2ON	AMP2 ON Thresh ( ABL VTH )	4			
	FIX 8	8	A3ON	AMP3 ON Thresh ( ACL VTH )	4			
	FIX 9	9	A2FL	AMP2 OFF Thresh L ( AMP2 OFF LEVEL LOWER )	64			
	FIX 10	10	A3FL	AMP3 OFF Thresh L ( AMP3 OFF LEVEL LOWER )	64			
	FIX 11	11	AXTH	AXIS HYS ( AXS HYS )	30			
	FIX 12	12	ACTH	ROM HYS ( ROM HYS )	10			
	FIX 13	13	AVAV	AVE SEL AV (AVE SEL AV )	3			
	FIX 14	14	B2TH	B2COMP ( B2COMP )	0			
	FIX 15	15	ACCP	ACC COMP ( ACC COMP )	0			

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data	Video	YUV	16:09
RGB	FIX 1	AMUT	RGB POWER ON MUTE ( RGB POWER ON MUTE )	0				
	FIX 2	PMUT	RGB Mute before OSD ( RGB MUTE [ EXCEPT OSD ] )	1				
	FIX 3	CORL	CUTOFF R L ( R CUTOFF LOWER )	212				
	FIX 4	CORH	CUTOFF R H ( R CUTOFF UPPER )	0				
	FIX 5	COGL	CUTOFF G L ( G CUTOFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL" )	197				
	FIX 6	COGH	CUTOFF G H ( G CUTOFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL" )	0				
	FIX 7	COBL	CUTOFF B L ( B CUT OFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL" )	176				
	FIX 8	COBH	CUTOFF B H ( B CUT OFF LOWER WHEN TEMP IS "COOL" AND "NEUTRAL" )	0				
	FIX 9	ABLS	ABL SEL ( ABL SELECT )	0				
	FIX 10	ALSP	ACL SPEED ( ACL SPEED )	0				
	FIX 11	ALRS	ACL SPE ( ACL RECOVER SPEED )	2				
	FIX 12	ALAS	ACL ASPE ( ACL ATACK SPEED )	9				
	FIX 13	ABLG	ABL GAIN ( ABL GAIN )	5				
	FIX 14	ALS2	ACLASPE2 ( ACL ATACK SPEED [ 2 ] )	2				
	FIX 15	AKBM	AKB MODE ( AKB MODE )	0				
	FIX 16	AKBP	AKB P[5:0] ( AKB PULSE HEIGHT )	16				
	FIX 17	OSDL	OSD LIMIT ( OSD LIMMIT SELECT )	0				
	FIX 18	UVIN	Y/U/V UVINV ( U/V INVERT )	0				
	FIX 19	UVG	U/V GAIN ( U/V OFFSET CANCELER ON )	0				
	FIX 20	UOFS	U IN OFFSET ( U IN OFF SET )	15				
	FIX 21	VOFS	V IN OFFSET ( V IN OFFSET )	12				
	FIX 22	AALG	ANA ACL GAIN ( ANALOG ACL GAIN CONTROL )	0				
	FIX 23	AALS	ANA ACL ON ( ANALOG ACL ON/OFF CONTROL )	1				
	FIX 24	UVDE	UV_DITHER_EN ( UVIN DITHER ENABLE )	0	0	1	N/A	
	FIX 25	UVDT	UV_DITHER_TEST ( UVIN DITHER TEST )	0	0	6	N/A	

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data	Video	YUV	16:09
DEFD	FIX 1	HFFR	AFC FREE RUN ( AFC1 FORCE FREE RUN )	0				
	FIX 2	HFUP	HFREE UP ( H FREE RUN FREQUENCY UP [ 700 Hz ] )	0				
	FIX 3	JSWW	VJP WIDTH ( JUMP PULSE WIDTH )	0				
	FIX 4	EWCL	V/EW DAC CLK CONTROL ( EW/VRAMP DA CLOCK SELECT )	0	0	0		N/A
	FIX 5	XF0A	FREE RUN OFFSET ( VCXO FREE RUN ADJUST)	0				
	FIX 6	BGST	BG START ( BGP [ FOR PLL ] TIMING )	16	16	1		N/A
	FIX 7	XPHA	VCXO CTL ( VXCO PHASE ADJUST )	10				
	FIX 8	HRMP	Ramp Slew Rate ( AFC2 TIME CONSTANT )	3				
	FIX 9	RPLU	Ref Charge pump ( REF PLL TIME CONSTANT )	3				
	FIX 10	RPLB	Ref VCO ( REF PLL TIME CONSTANT )	1				
	FIX 11	XF0B	VCXO FREE RUN ( VXCO Fo ADJUST )	0				
	FIX 12	RPLS	REF FB SW ( REF VCO FB LOOP SELECT )	0				
	FIX 13	SSM	Sync Sepa Mask ( SyncSepaMasking CONTROL )	0				
	FIX 14	VSAG	V-sag ( V-SAG prevent ON )	0				
	FIX 15	AFC2	AFC2 Gain ( AFC2 GAIN CONTROL )	3				
	FIX 16	VRFL	V RAMP FIL OFF ( V RAMP FILTER SWITCHING OFF )	1				
	FIX 17	SSLP	LPY SYNC ( LFP pre SYNC SEPA ON/OFF	1				
	FIX 18	XPLU	B PLL Change pump ( ACP TIME CONSTANT )	1				
	FIX 19	8FSC	8FSC SEL ( 8fsCLK Skew OFF )	1	1	0		N/A
	FIX 20	4FS2	4FSC SEL2 ( 4fsCLK Skew OFF )	1	1	0		N/A
	FIX 21	CDM2	V_CD_MODE2 ( V_LOGIC SW )	1				
	FIX 22	BGPC	Add. FTN BGP C ( BGP C )	0				
	FIX 23	MHDL	Add. FTN BGP SEL ( BBP SEL )	1				
	FIX 24	BFRE	V FREE ( FORCE V FREE RUN )	0				
	FIX 25	HRPP	AFC2 RAMP POS ( FRAMP RRAMP H OUT CONTROL RANGE	8				
	FIX 26	DSCK	CLOCK SEL ( DS DAC CLK SW 2 )	1	1	1		0
	FIX 27	VBHK	VBLK HALFKIL ( V BLK HALF KILL )	0				
	FIX 28	VPW	V PLS WIDTH ( V Pulse Wide )	1				
	FIX 29	DTH	D THRESHOLD LEVEL ( DITHER THRESHOLD LEVEL CONTROL AT IIC AUTOD= ON	0				
	FIX 30	SLON	LPF SYNC ON ( LPF SYNC ON )	1				

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data	Video	YUV	16:09
DEFD	FIX 31	VSSW		SYNC SLICE LVL(V)_W ( SYNC SLICE LEVEL [ V ] Wide Window	0			
	FIX 32	AF2S		AFC2_SEL ( ADC2 TIMING SW )	0			
	FIX 33	VSL2		V_SYNC_LPF_2 ( DIGITAL V_SYNC_LPF [ Fall ] )	0			
	FIX 34	VSL1		V_SYNC_LPF_1 ( DIGITAL V_SYNC_LPF [ Rise ] )	1			
	FIX 35	VYUV		YUV VSIZE OFFSET ( YUV V-SIZE OFFSET )	8			
	FIX 36	VYVP		YUV VPOS OFFSET ( YUV V-POSITION OFFSET )	8			
	FIX 37	VYHS		YUV HSIZE OFFSET ( YUV H-SIZE OFFSET )	8			
	FIX 38	VYHP		YUV HPOS OFFSET ( YUV H-POSITION OFFSET )	7			
	FIX 39	VSHE		V-SHRINK MODE ( V-SHRINK MODE for AV )	0			
	FIX 40	VYRB		YUV RBLK ( YUV RBLK OFFSET )	7			
	FIX 41	YVLB		YUV LBLK ( YUV LBLK OFFSET )	7			

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data	Video	YUV	16:09
OTHER	FIX 1	PCLP		pedestal CLAMP ON/OFF ( SYNC TIP/PEDESTAL CLAMP SELECT )	0			
	FIX 2	VRT		VRT Voltage ( ADC REFERENCE [ 00:1.15Vpp 01:1.25 Vpp 10:1.35 Vpp 11:1.45 Vpp ] )	1			
	FIX 3	14HI		INV 14H CLK ( 4fsc [ Skew ] CLK POLARITY )	0	0	0	N/A
	FIX 4	14HD		14H CLK DLY ( 4fscCLK [ Skew ] CLK DELAY ADJUST )	0	0	0	N/A
	FIX 5	DSI		INV DS CLK ( 8fscCLK POLARITY )	0	0	0	N/A
	FIX 6	DSD		DS CLK DLY ( 8fscCLK DELAY ADJUST )	0	0	0	N/A
	FIX 7	ADCD		AD CLK DLY ( ADC CLK DELAY ADJUST )	0	0	1	N/A
	FIX 8	4FSC		4FSC SW ( AD/LOGIC CLK SWAP )	0			
	FIX 9	WSTH		WEAK_SIG_VTH ( WEAK_SIGNAL VTH )	0			
	FIX 10	WSVA		WEAK SIG VIDEO ATT ( WEAK SIGNAL VIDEO ATT )	0	0	0	N/A
	FIX 11	WSCA		WEAK SIG CHROMA ATT (WEAK SIGNAL CHROMA ATT)	0	0	0	N/A
	FIX 12	VREF		VREF_SEL ( AD REFERENCE SELECT [ VZ ] )	0			

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
OSD	FIX 1	HT		HT ( HALF TONE LEVEL )	0
	FIX 2	OSLR		OSD LVL R ( R OSD LEVEL )	25
	FIX 3	OSLG		OSD LVL G ( G OSD LEVEL )	25
	FIX 4	OSDC		OSD COMP ( OSD COMP )	0
	FIX 5	OSLB		OSD LVL B ( B OSD LEVEL )	25

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
H/W AKB	FIX	1	HRIL	H/W AKB RINI DATA L ( H/W AKB RED OUTPUT LOWER )	soft cont'l
	FIX	2	HRIH	H/W AKB RINI DATA H ( H/W AKB RED OUTPUT UPPER )	soft cont'l
	FIX	3	HGIL	H/W AKB GINI DATA L ( H/W AKB GREEN OUTPUT LOWER )	soft cont'l
	FIX	4	HGIH	H/W AKB GINI DATA H ( H/W AKB GREEN OUTPUT UPPER )	soft cont'l
	FIX	5	HBIL	H/W AKB BINI DATA L ( H/W AKB BLUE OUTPUT LOWER )	soft cont'l
	FIX	6	HBIH	H/W AKB BINI DATA H ( H/W AKB BLUE OUTPUT UPPER )	soft cont'l
	FIX	7	HLM1	AKB_LIM1<7:0> ( H/W AKB LIM1 )	6
	FIX	8	HLM2	AKB_LIM2<7:0> ( H/W AKB LIM2 )	12
	FIX	9	HLM3	AKB_LIM3<7:0> ( H/W AKB LIM3 )	21
	FIX	10	HAD1	AKB_ADD1<7:0> ( H/W AKB SPEED1 )	2
	FIX	11	HAD2	AKB_ADD2<7:0> ( H/W AKB SPEED2 )	6
	FIX	12	HAKE	AKB_EN ( H/W AKB MANUAL [MCU] / HARD )	1
	FIX	13	HASP	AKB_SPEED ( H/W AKB SPEED )	3
	FIX	14	HERL	AKB_SWERR<7:0> ( H/W AKB ERROR DET THRESH )	40
	FIX	15	HLMC	AKB_ERRC<7:0> ( H/W AKB ERROR DET TIME )	20
	FIX	16	HPWL	AKBSWPON<7:0> ( H/W AKB POWER ON TRESH )	4
	FIX	17	HPWC	AKB_PWERRC ( H/W AKB POWER ON TIME )	90
	FIX	18	HFMT	H/W AKB2 HOLD TIMER ( H/W AKB2 HOLD TIMER 100 MSEC ) [ 0: No hold ]	(@ 20
	FIX	19	SPMT	AKB POW ON MUTE EXIT ( AKB POWER ON MUTE EXIT TICKER )	120

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC	
					29FA310	27/29FS120
AUDIO PROCE SSOR	VAR 1	SBAL	SBAL ( SUB BALANCE )		4	4
	VAR 2	SBAS	SBAS ( SUB BASS )		0	0
	VAR 3	STRE	STRE ( SUB TREBLE )		6	0
	VAR 4	SRL	SRL ( SURROUND LEVEL )		0	0
	VAR 5	BBOL	BBOL ( SURROUND OFF-BBE LOW )		8	6
	VAR 6	BBOH	BBOH ( SURROUND OFF-BBE HIGH )		4	5
	VAR 7	BBSL	BBSL ( SIMULATE BBE LOW )		2	4
	VAR 8	BBSH	BBSH ( SIMULATE BBE HIGH )		4	4
	VAR 9	BBGL	BBGL ( WOW GAME BBE LOW )		6	0
	VAR 10	BBGH	BBGH ( WOW GAME BBE HIGH )		4	0
	VAR 11	BBTL	BBTL ( SRS BBE LOW )		0	6
	VAR 12	BBTH	BBTH ( SRS BBE HIGH )		0	4
	VAR 13	BBDL	BBDL ( Audio Processor Prologic BBE Low for DOLBY )		6	0
	VAR 14	BBDH	BBDH ( Audio Processor Prologic BBE High for DOLBY )		4	0
	VAR 15	VFIX	VFIX ( AUDIO OUTPUT FIX DATA )		0	243
	VAR 16	AGCL	AGCL ( AGC LEVEL )		2	2
	VAR 17	VCOF	RF OFFSET DATA		9	9

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC	
					29FA310	27/29FS120
AP2	VAR 1	BBEL	SUB AUDIO PROCESSOR PROLOGIC BBE LOW		9	0
	VAR 2	BBEH	SUB AUDIO PROCESSOR PROLOGIC BBE HIGH		9	0
	VAR 3	BBOL	SURROUND OFF-BBE LOW		9	0
	VAR 4	BBSL	SIMULATE BBE LOW		5	0
	VAR 5	BBGL	WOW GAME BBE LOW		10	0
	VAR 6	AGCL	SUB AUDIO PROCESSOR AGC LEVEL		2	0
	VAR 7	DDOF	DOLBY OFFSET DATA		15	0

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
MICROPROCESSOR	FIX	1	DISP	DISP ( OSD HORIZONTAL OFFSET )	55
	FIX	2	CCHP	CCHP ( FOR TILT DATA CALCULATION )	80
	FIX	3	HRLW	HRLW ( LOW LIMIT OF H-PULSE COUNTING WINDOW [ RF ] )	16
	FIX	4	HRHG	HRLG ( HIGH LIMIT OF H-PULSE COUNTING WINDOW [ RF ] )	64
	FIX	5	HSDT	HSDTCT ( H-PULSE DETECTION [ S-VIDEO ] )	8
	FIX	6	STPI	STPI ( GRADUAL CONTRAST INCREASE STARTING LEVEL )	40
	FIX	7	RAPI	RAPI (GRADUAL CONTRAST INCREASE Vsync COUNTER)	10

Service Group	Fix/Var	No.	Name	Item name & ( Description )	NTSC Init Data
Feature	VAR		ID0	Language related	81
	VAR		ID1	Video related	31
	VAR		ID2	Audio related	113
	VAR		ID3	Miscellaneous	130
	VAR		ID4	Miscellaneous	32
	VAR		ID5	Miscellaneous	24
	VAR		ID6	Miscellaneous	48
	VAR		ID7	Miscellaneous	69

## 4-5. ID MAP TABLE

Model	Destination	ID-0	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6	ID-7
KV-27FA310	US	81	31	17	130	32	24	48	69
KV-27FA310	CND	81	31	17	130	32	24	48	69
KV-27FS120	US	89	31	17	34	0	24	0	5
KV-27FS120	CND	89	31	17	50	0	24	0	5
KV-29FS120	L NORTH	81	31	17	130	32	24	48	69
KV-29FS120	L SOUTH	81	31	17	130	32	24	48	69
KV-29FA310	L NORTH	81	31	113	130	32	24	48	69
KV-29FA310	L SOUTH	81	31	113	130	32	24	48	69

## 4-6. A BOARD ADJUSTMENTS

### H. Frequency (Free Run) Check

1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q502 (TP-25 H. DRIVE) on the A Board.
3. Check H. Frequency for  $15735 \pm 200$  Hz.

### V. Frequency (Free Run) Check

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter to TP-27 (V OUT) or CN515 pin ⑥ (V DY+) and ground on the A Board.
4. Check that V. Frequency shows  $60 \pm 4$  Hz.

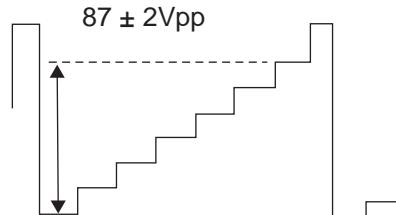
### Drive (SCON)

1. Input a color-bar signal and set the level to 75%.
2. Set in Pro mode + PICTURE MAX.
3. Activate the Service Adjustment Mode.
4. Set GON and BON items. Using ③ and ⑥ set each to the following values. Leave RON set to "1".

Mode	Category	Display Item	Item Data
service	video	rdrv	26
ntsc			

R ON: ON (1)  
G ON: OFF (0)  
B ON: OFF (0)

7. Adjust the value of SCON with ③ and ⑥ for  $87 \pm 2$ Vpp.



8. Reset GON and BON values to "1".

R ON: ON (1)  
G ON: ON (1)  
B ON: ON (1)

9. Press [MUTING] then [ENTER] to save into the memory.

### Display Position Adjustment (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with ① and ④.
4. Adjust values of DISP with ③ and ⑥ to adjust characters to the center.
5. Press [MUTING] then [ENTER] to save into the memory.
6. Check to see if the text is displayed on the screen.

Mode	Category	Display Item	Item Data
service	micro	disp	48
ntsc			

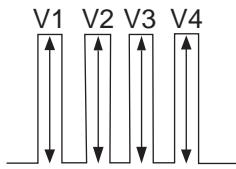
5. Connect an oscilloscope probe to CW Board, JW2704 (KR).
6. Select SCON with ① and ④.

## Sub Bright Adjustment (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with **1** and **4**.
5. Adjust the values of SBRT with **3** and **6** to obtain a faintly visible 20 IRE mark, after that increase +3 steps.
6. Press **MUTING** then **ENTER** to save into the memory.

## Sub Hue, Sub Color Adjustment (SHUE, SCOL)

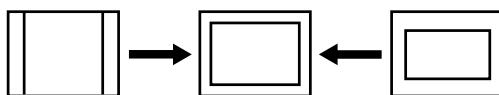
1. Input color-bar signal at 75%.
2. Activate the Service Adjustment Mode.
3. Set (PIC) to Max and (COL) to 50%.
4. Connect an oscilloscope probe to CW Board, JW7408 (Blue Out).
5. Select the SHUE and SCOL item with **1** and **4**.
6. While showing the SHUE item, adjust the waveform with **3** and **6** until the second and third bars show the same level ( $V2 = V3 < 0.15Vp-p$ ). Set Sub Hue -2 Step.
7. While showing the SCOL item, adjust the waveform with **3** and **6** until the first and fourth bars show the same level ( $V1 = V4 < 0.15Vp-p$ ). Set Sub Col +2 Step.



8. Press **MUTING** then **ENTER** to save into the memory.

## V. Size Adjustment (VSIZ)

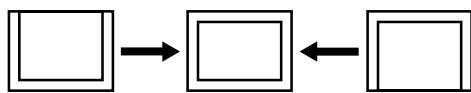
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VSIZ item with **1** and **4**.
4. Adjust value of VSIZ with **3** and **6** for the best vertical size.
5. Press **MUTING** then **ENTER** to save into the memory.



## V. Center Adjustment (VPOS)

Perform this adjustment after performing H. Frequency (Free Run) Check.

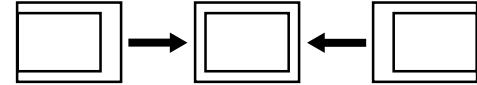
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VPOS item with **1** and **4**.
4. Adjust value of VPOS with **3** and **6** for the best vertical center.
5. Press **MUTING** then **ENTER** to save into the memory.



## H. Center Adjustment (HPOS)

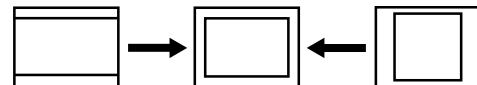
Perform this adjustment after performing H. Frequency (Free Run) Check.

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the HPOS item with **1** and **4**.
4. Adjust the value of HPOS with **3** and **6** for the best horizontal center.
5. Press **MUTING** then **ENTER** to save into the memory.



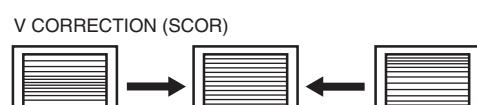
## H. Size Adjustment (HSIZ)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Select HSIZ with **1** and **4**.
4. Adjust with **3** and **6** for the best horizontal size.
5. Press **MUTING** then **ENTER** to save into the memory.



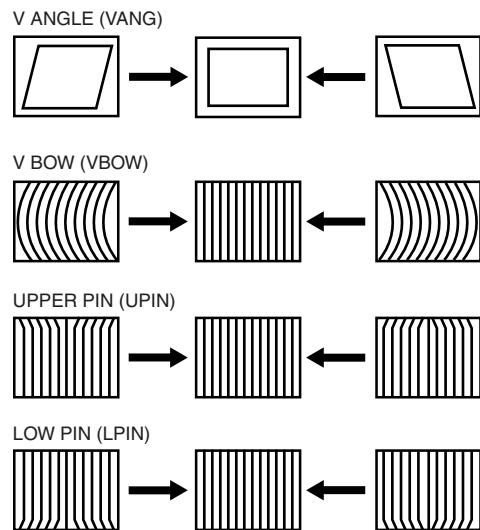
## V. Linearity (VLIN), V. Correction (SCOR), PIN Amp (PAMP), and Horizontal Trapezoid (HTRP) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VLIN, SCOR, PAMP, and HTRP with **1** and **4**.
4. Adjust with **3** and **6** for the best horizontal size.
5. Press **MUTING** then **ENTER** to save into the memory.



## V. Angle (VANG), V. Bow (VBOW), Upper PIN (UPIN) and Low PIN (LPIN) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VANG, VBOW, UPIN, and LPIN with **1** and **4**.
4. Adjust with **3** and **2** for the best picture.
5. Press **MUTING** then **ENTER** to save into the memory.



## Service Adjustment Mode Memory

1. After completing all adjustments, press **0** then **ENTER**.

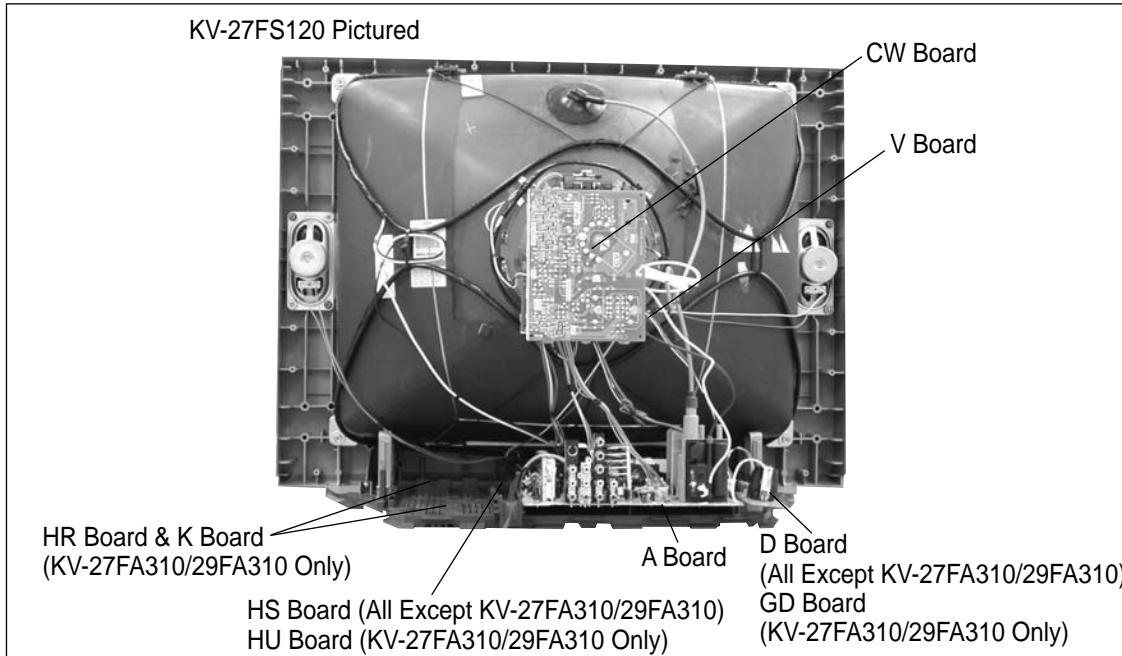
Read From Memory

Mode	Category	Display Item	Item Data
service	defl	vbow	7
Signal Type			
ntsc			
vchp	00000000 00000000		

Green **0**  
Red  
**ENTER**

## SECTION 5: DIAGRAMS

### 5-1. CIRCUIT BOARDS LOCATION



### 5-2. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM INFORMATION

All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$  :  $\mu\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.

All electrolytics are in 50V unless otherwise specified.

All resistors are in ohms.  $\text{k}=1000$ ,  $\text{M}=1000\text{k}$

Indication of resistance, which does not have one for rating electrical power, is as follows: Pitch : 5mm Rating electrical power :

$1/4\text{ W}$  in resistance,  $1/10\text{ W}$  and  $1/8\text{ W}$  in chip resistance.

: nonflammable resistor.

: fusible resistor.

$\Delta$  : internal component.

: panel designation and adjustment for repair.

: earth ground

: earth-chassis

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

Readings are taken with a color-bar signal input.

Readings are taken with a 10M digital multimeter.

Voltages are DC with respect to ground unless otherwise noted.

Voltage variations may be noted due to normal production tolerances.

All voltages are in V.

S : Measurement impossibility.

: B-line. (Actual measured value may be different).

: signal path. (RF)

Circled numbers are waveform references.

The components identified by shading and  $\Delta$  symbol are critical for safety. Replace only with part number specified.

The symbol indicates a fast operating fuse and is displayed on the component side of the board. Replace only with fuse of the same rating as marked.

Les composants identifiés par un trame et une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Le symbole indique une fusible à action rapide. Doit être remplacé par une fusible de même valeur, comme maqué.

### REFERENCE INFORMATION

#### RESISTOR

: RN	METAL FILM	: TA	TANTALUM
: RC	SOLID	: PS	STYROL
: FPRD	NONFLAMMABLE CARBON	: PP	POLYPROPYLENE
: FUSE	NONFLAMMABLE FUSIBLE	: PT	MYLAR
: RW	NONFLAMMABLE WIREWOUND	: MPS	METALIZED POLYESTER
: RS	NONFLAMMABLE METAL OXIDE	: MPP	METALIZED POLYPROPYLENE
: RB	NONFLAMMABLE CEMENT	: ALB	BIPOLAR
: $\times$	ADJUSTMENT RESISTOR	: ALT	HIGH TEMPERATURE
: LF-8L	MICRO INDUCTOR	: ALR	HIGH RIPPLE

#### COIL

The components identified by **█** in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be necessary, replace only with the value originally used.

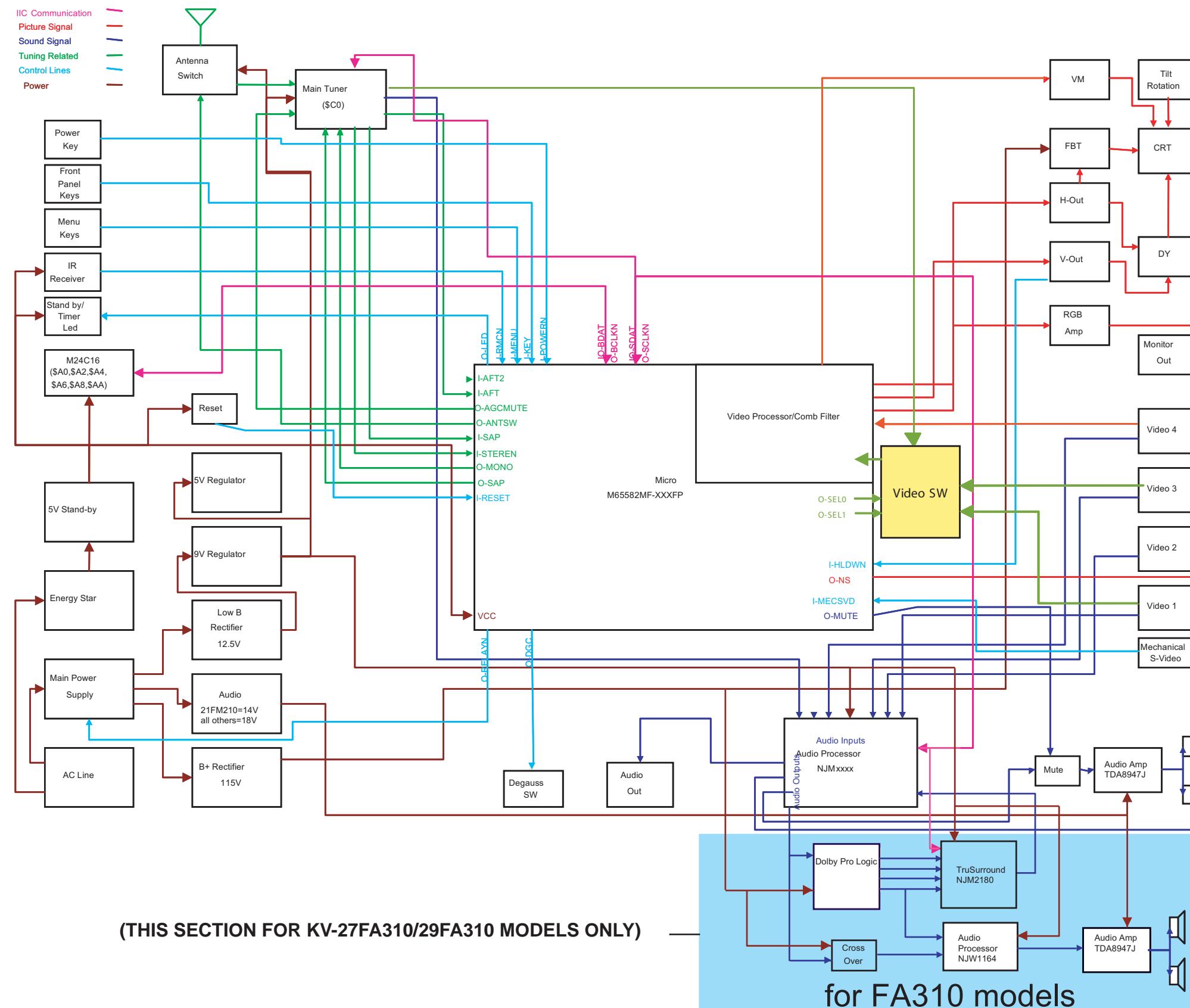
When replacing components identified by **█**, make the necessary adjustments as indicated. If the results do not meet the specified value, change the component identified by **█** and repeat the adjustment until the specified value is achieved.

(Refer to Section 3: Safety Related Adjustments on Page 17.)

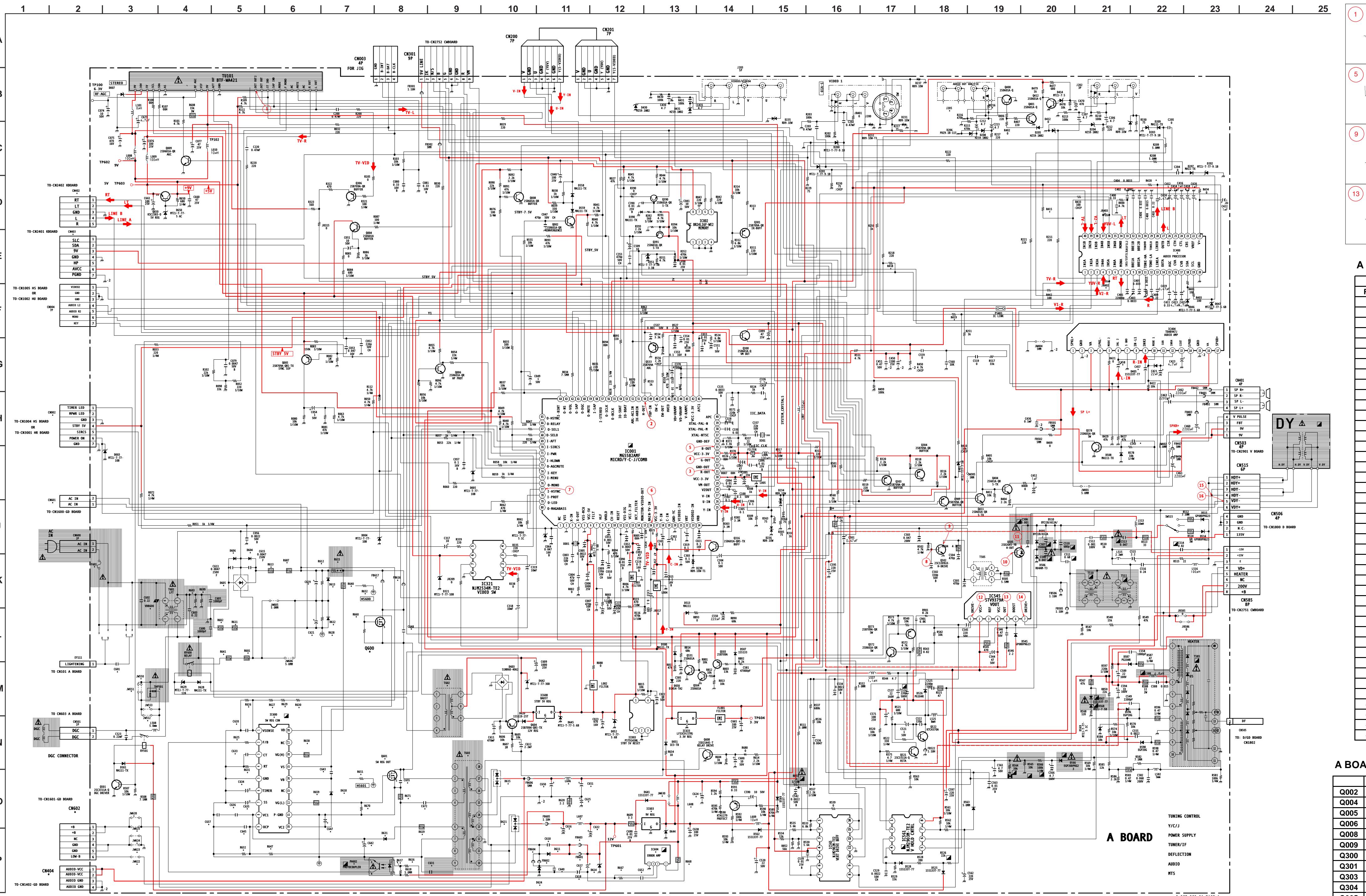
When replacing the parts listed in the table below, it is important to perform the related adjustments.

Part Replaced ( <b>█</b> )	Adjustment ( <b>█</b> )
DY, T585, CRT, IC001, IC561, IC600, IC604, C506, C507, C508, C510, C511, C513, C514, L588, D566, D567, D568, PH602, R526, R564, R565, R566, R851, T510, T511.....A Board	HV HOLD-DOWN R564

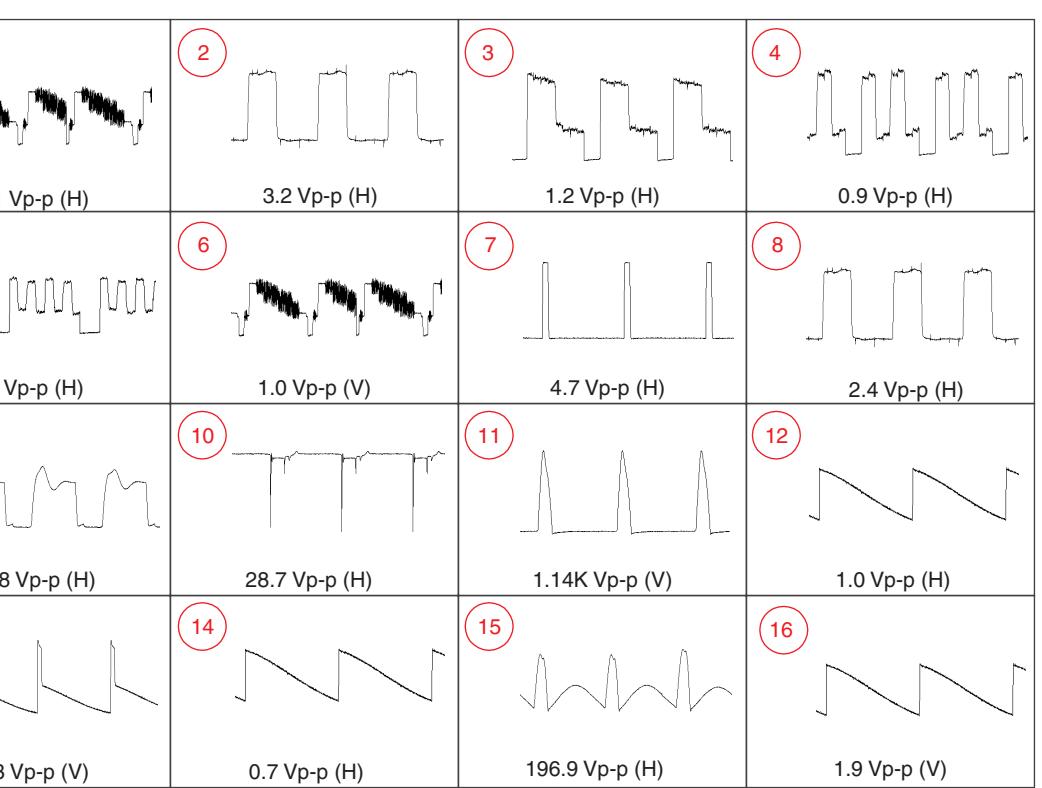
### 5.3. BLOCK DIAGRAM AND SCHEMATICS



## A BOARD SCHEMATIC DIAGRAM



## A BOARD WAVEFORMS



## A BOARD IC VOLTAGE LIST

	IC001	44	1.6	7	GND	25	3.9	IC561	IC603
PIN	VOLT	45	1.6	8	5.0	26	0.6	PIN	VOLT
1	N/C	46	2.3			27	4.5	1	0.1
2	GND	47	1.0			28	4.5	2	3.4
3	2.2	48	N/C	1	N/C	29	4.5	3	2.3
4	2.2	49	0.5	2	GND	30	4.5	4	GND
5	GND	50	1.2	3	GND	31	4.5	5	9.2
6	5.0	51	2.0	4	5.0	32	4.5	6	10.2
7	0.0	52	1.5	5	5.0	33	4.5	7	0.1
8	2.0	53	4.8			34	N/C	8	13.5
9	0.3	54	4.8			35	N/C	IC565	4
10	2.1	55	4.8	1	4.5	36	N/C	PIN	VOLT
11	5.0	56	4.8	2	0.3	37	4.5	1	3.4
12	GND	57	N/C	3	4.5	38	4.5	2	3.4
13	3.3	58	5.2	4	0.4	39	4.5	3	2.1
14	3.1	59	0.0	5	4.5	40	4.5	4	9.0
15	1.0	60	0.0	6	9.0	41	IC404	5	1.0
16	1.5	61	0.0	7	4.4	42	PIN	VOLT	6
17	3.3	62	0.0	8	GND	43	1.0	PIN	VOLT
18	0.5	63	1.4			44	IC400	2	GND
19	1.1	64	4.9			45	19.6	8	1.6
20	GND	65	4.9	1	4.5	46	8.3	10	1.6
21	0.5	66	0.0	2	4.5	47	19.6	11	GND
22	1.7	67	0.1	3	4.5	48	3.2	12	1.6
23	0.5	68	0.1	4	4.5	49	0.0	13	1.6
24	0.5	69	2.4	5	N/C	50	8.0	14	1.6
25	0.5	70	5.0	6	N/C	51	9.3	IC600	
26	0.0	71	5.0	7	N/C	52	9.1	PIN	VOLT
27	0.0	72	0.1	8	4.5	53	11	9.7	1
28	2.1	73	0.0	9	4.5	54	3.2	2	1.8
29	2.7	74	5.0	10	4.5	55	0.0	13	3.3
30	3.3	75	5.0	11	4.5	56	4.8	14	2.5
31	2.9	76	5.0	12	4.5	57	15	GND	5
32	GND	77	0.1	13	4.5	58	19.6	6	0.0
33	2.8	78	0.0	14	4.5	59	8.3	7	4.0
34	3.3	79	4.9	15	0.6	60	IC545	8	17.2
35	2.9	80	4.9	16		61	IC002	17	0.7
36	GND	81	1.7	1		62	10	10.4	
37	1.8	82	4.8	2		63	13.5	11	0.0
38	0.0	83	1	GND		64	12	4.6	
39	0.1	84	2	GND		65	-12.2	12	
40	2.0	85	3	GND		66	14	163.6	
41	1.6	86	4	GND		67	15	153.5	
42	3.3	87	5	4.8		68	7	157.6	
43	N/C	88	6	4.8		69	17	N/C	
						70	34.0		

All voltages are in V.

## A BOARD TRANSISTOR VOLTAGE LIST

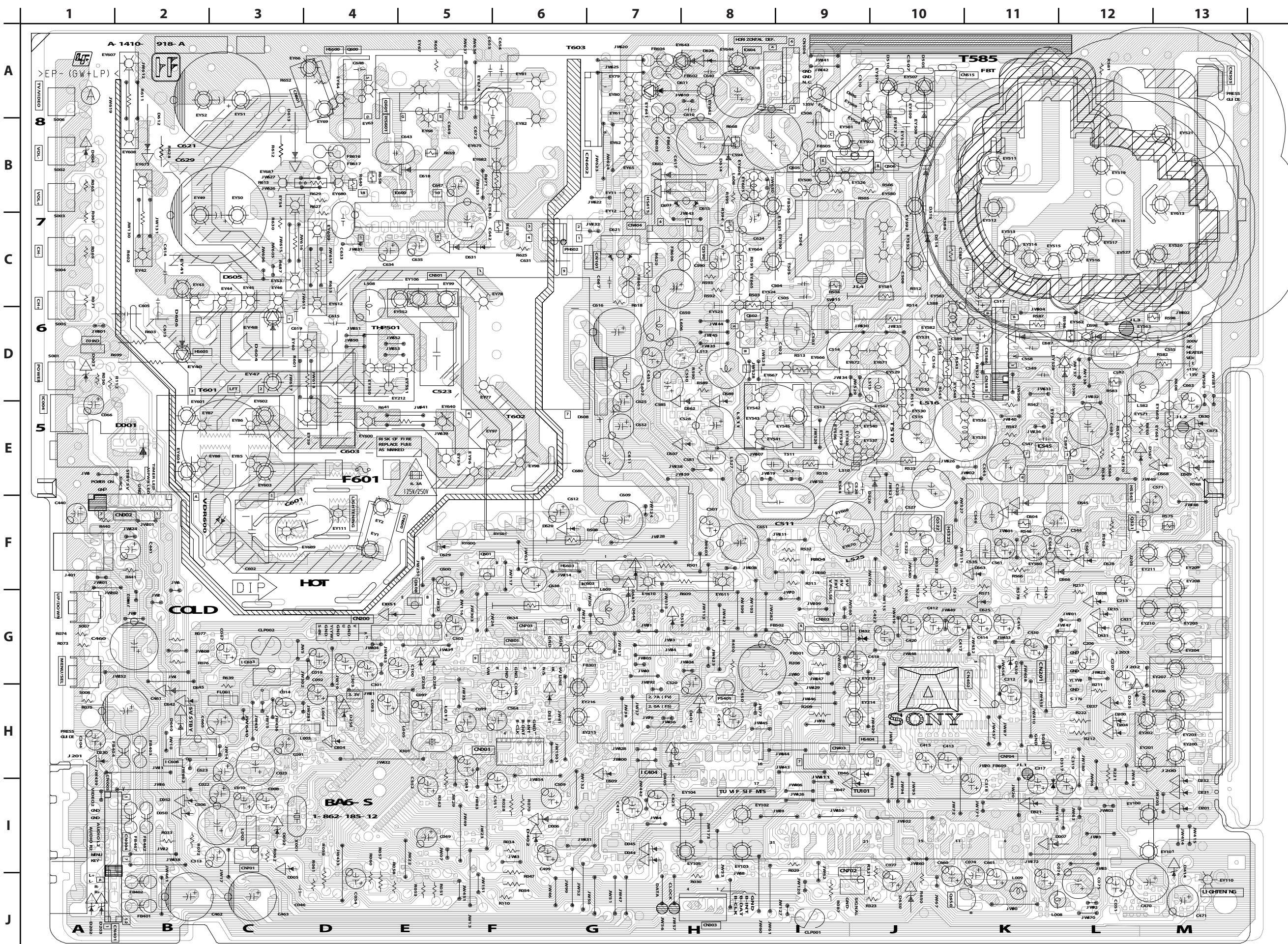
	B	C	E	B	C	E	D	G	S
Q002	0.0	2.0	GND	Q411	0.0	5.8	GND		
Q004	3.8	9.0	4.4	Q412	0.1	0.1	GND		
Q005	5.1	0.8		Q501	0.0	14.3	GND		
Q006	0.0	0.0		Q502	0.0	74.1	GND		
Q008	0.0	2.6		Q503	0.0	2.9	0.9		
Q009	0.0	5.2		Q504	0.0	0.0	GND		
Q300	1.8	9.0	2.4	Q505	0.0	131.8	0.0		
Q301	3.6	2.1	3.6	Q521	0.0	3.8	GND		
Q303	3.6	GND	2.8	Q522	0.1	-2.1	0.0		
Q304	3.6	GND	2.9	Q531	0.0	0.0	GND		
Q305	3.6	GND	3.0	Q533	1.5	1.5	GND		
Q306	5.5	GND	4.9	Q572	0.0	2.6	GND		
Q316	0.0	3.3	0.0	Q573	2.6	0.0	2.6		
Q390	0.8	1.5	1.9	Q578	0.0	0.5	GND		
Q391	0.6	3.3	1.5	Q590	133.7	0.0	134.2		
Q400	0.0	0.1	GND	Q604	30.6	11.6	30.2		
Q401	0.0	0.1	GND	Q608	0.0	6.7	GND		
Q404	0.0	0.0	GND	Q650	5.8	9.0	5.0		

All voltages are in V.

A

[TUNING CONTROL, Y/C/J, POWER SUPPLY, TUNER/IF, DEFLECTION, AUDIO, MTS]

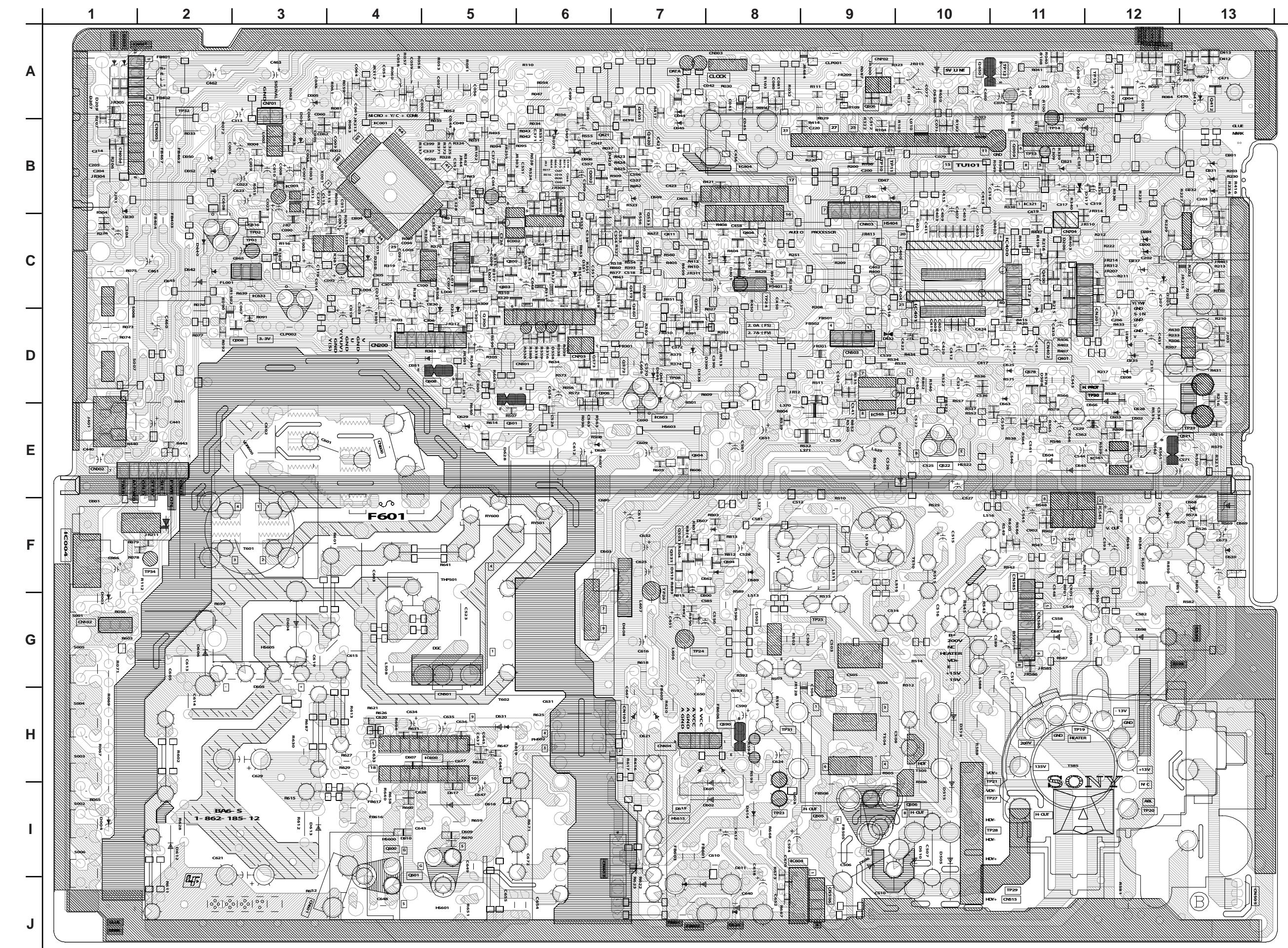
COMPONENT SIDE



A

[TUNING CONTROL, Y/C/J, POWER SUPPLY, TUNER/IF, DEFLECTION, AUDIO, MTS]

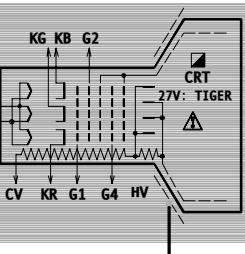
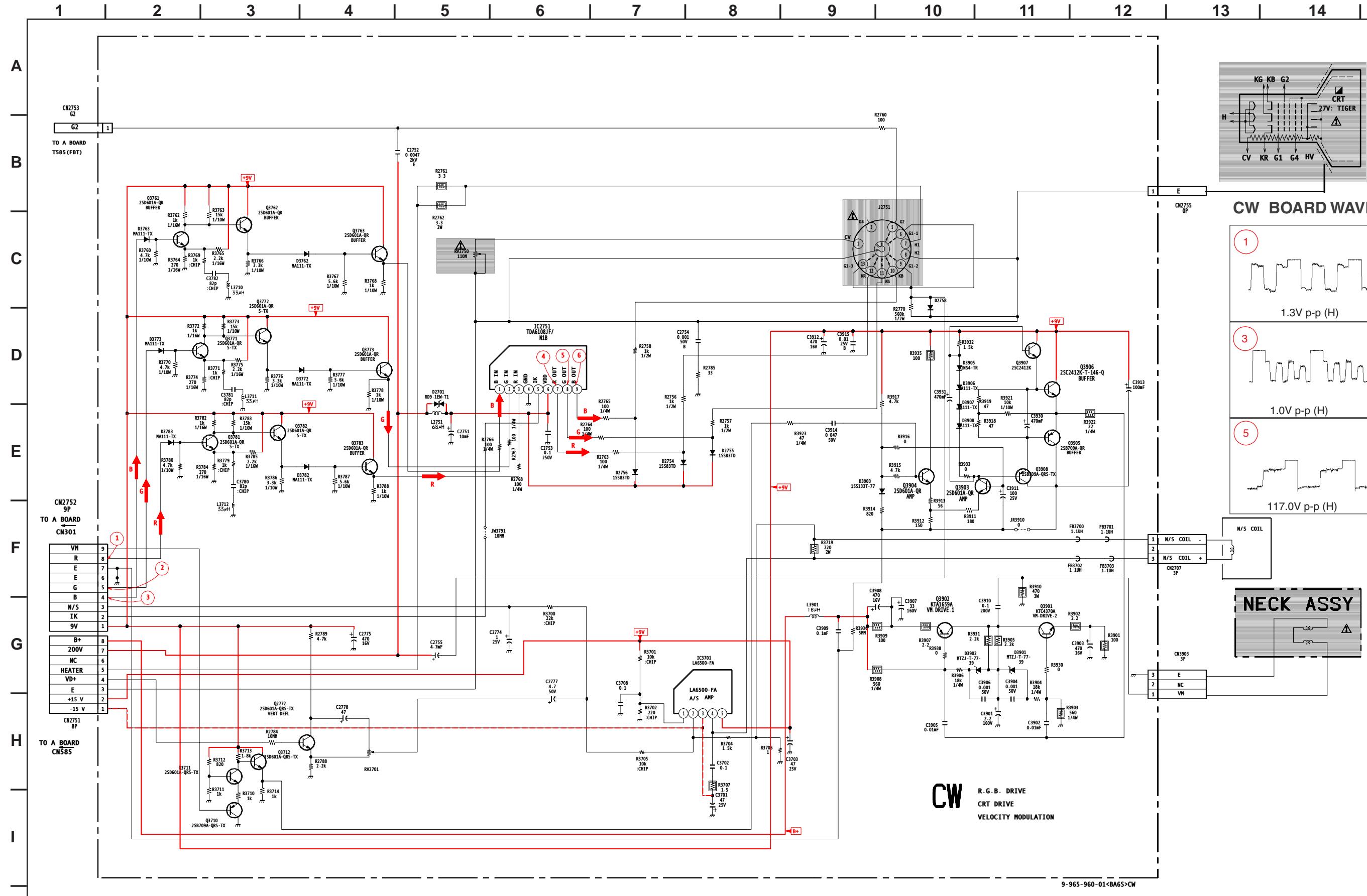
CONDUCTOR SIDE



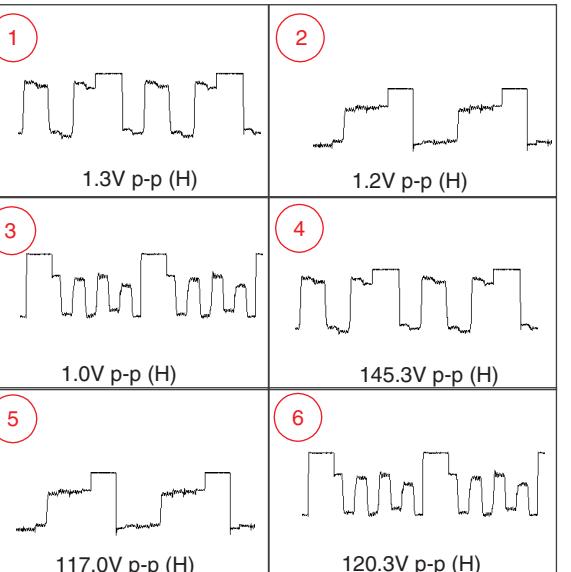
## A BOARD LOCATOR LIST CONDUCTOR SIDE

DIODE	D230	C1	D507	F8	D603	F7	IC002	C5	Q303	C5	Q522	E10	
D002	B3	D231	B13	D508	D11	D604	G3	IC003	B3	Q304	D6	Q531	F7
D003	G1	D232	B13	D510	I10	D605	G3	IC321	B11	Q305	C6	Q533	C7
D004	I1	D234	D5	D513	F7	D606	G3	IC400	C10	Q306	B9	Q572	D7
D005	A3	D235	D12	D514	H10	D611	J8	IC401	C10	Q316	C3	Q573	D6
D006	B6	D236	D5	D515	H10	D612	I2	IC404	B8	Q390	D7	Q578	D11
D007	B11	D237	C12	D525	D11	D613	I4	IC545	F11	Q391	C7	Q590	H8
D045	B7	D317	B11	D526	E10	D614	I8	IC561	E12	Q400	C11	Q600	I4
D046	B9	D321	B11	DIODE		D615	I7	IC565	E9	Q401	D11	Q601	I5
D047	B9	D351	C6	D528	E12	D618	I5	IC600	H5	Q403	A7	Q604	E8
D050	B2	D390	D8	D545	E11	D620	E6	IC603	D7	Q404	C8	Q608	D5
D051	D4	D401	C8	D558	D6	D621	H7	IC604	I9	Q411	C7	Q650	A10
D052	B2	D405	B7	D559	C7	D624	J8	IC608	B2	Q412	A13	Q860	C7
D200	C12	D412	A13	D562	F8	D628	E5	IC633	C3	Q420	B7		
D201	B13	D414	A13	D563	D11	D629	E5	TRANSISTORS		Q421	B6		
D202	A1	D420	B6	D566	E12	D631	H6	Q002	B6	Q501	E6		
D203	A1	D430	D11	D567	F12	D641	D7	Q004	A12	Q502	G8		
D204	B12	D431	D12	D568	F13	D642	C2	Q005	A12	Q503	F7		
D205	C12	D432	D9	D569	F13	D644	D7	Q006	D7	Q504	F8		
D206	C11	D500	G7	D587	G11	D645	C2	Q008	D3	Q505	I9		
D207	A11	D501	E6	D589	F8	D650	B10	Q009	B11	Q506	I10		
D208	D12	D505	I10	D596	G12	IC	Q300	D5	Q519	C7			
D209	A1	D506	I9	D598	G12	IC001	B4	Q301	C6	Q521	E12		

## CW BOARD SCHEMATIC DIAGRAM



## CW BOARD WAVEFORMS



## NECK ASSY

**CW**      R.G.B. DRIVE  
          CRT DRIVE  
          VELOCITY MODULATION

**CW BOARD IC VOLTAGE LIST**

IC3701	
PIN	VOLT
1	0.3
2	0.3
3	-15.0
4	0.5
5	15.0

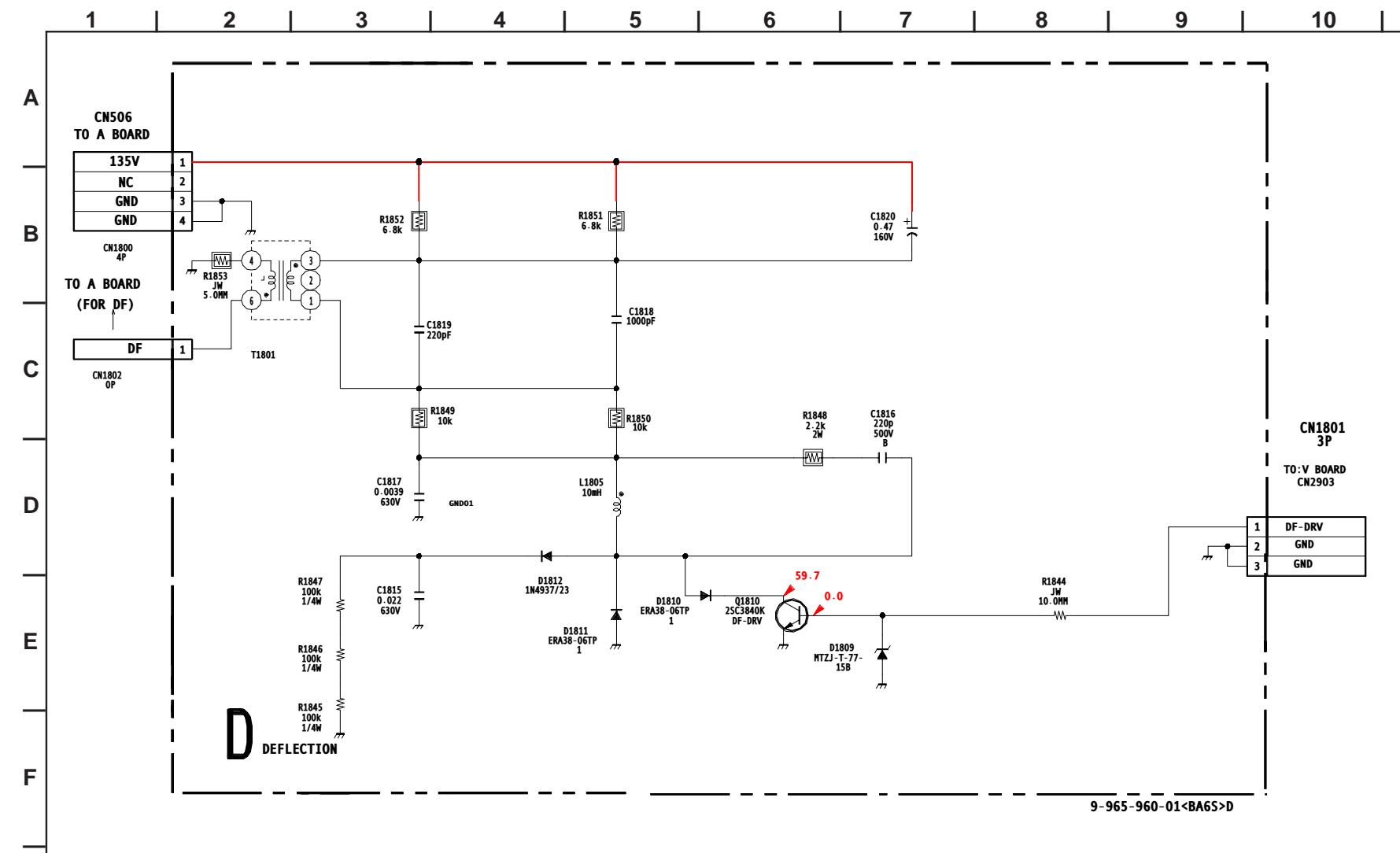
IC2751	
PIN	VOLT
1	2.0
2	2.0
3	2.4
4	GND
5	3.7
6	200.0
7	136.0
8	142.0
9	140.0

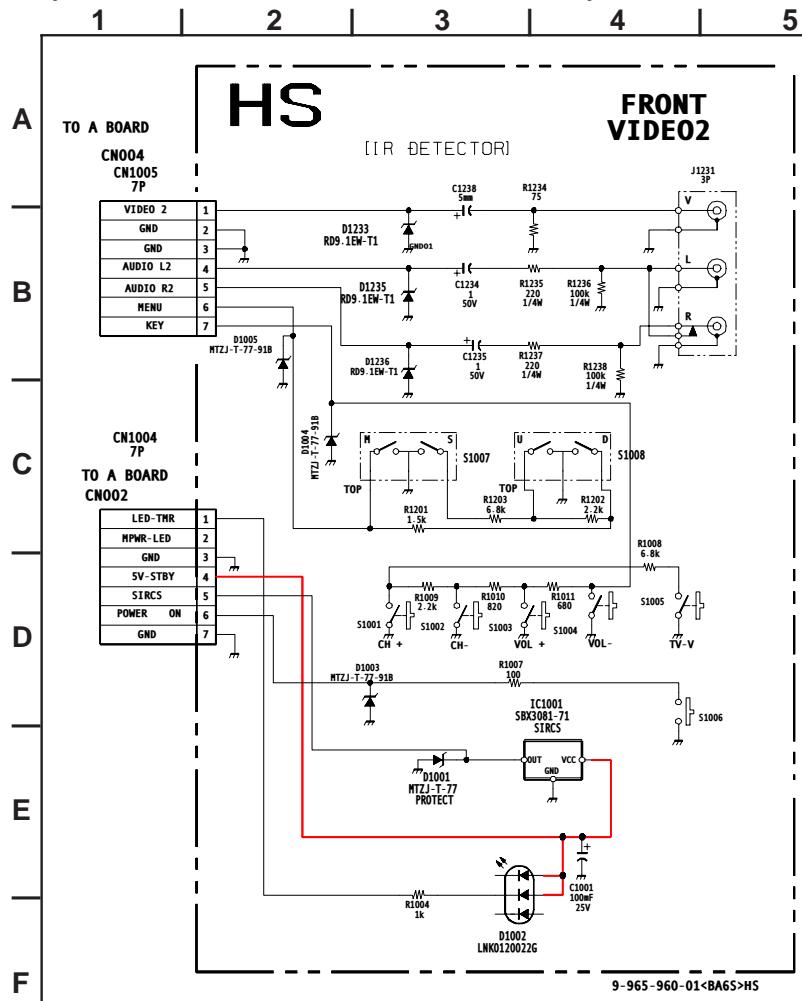
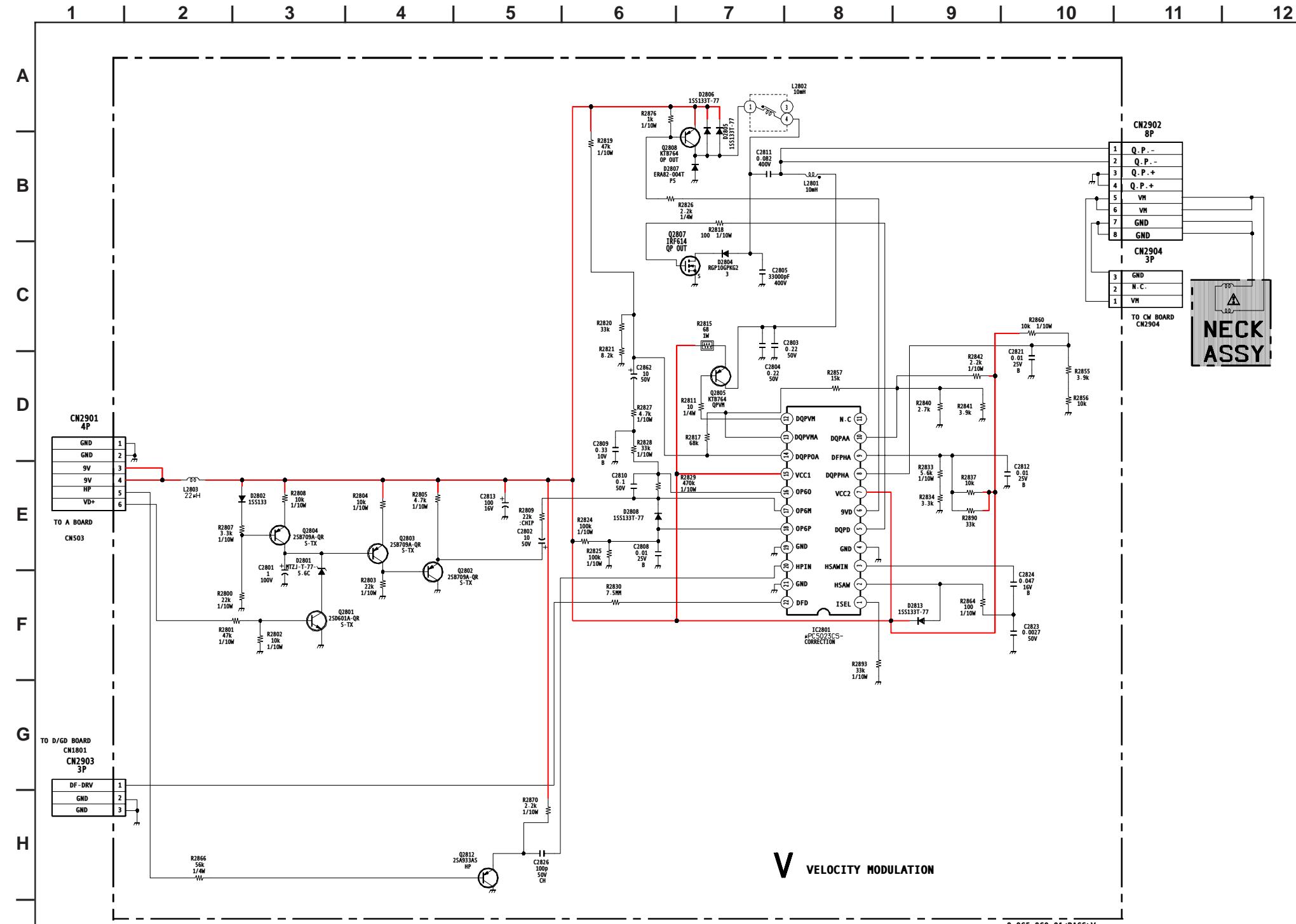
All voltages are in V.

**CW BOARD TRANSISTOR VOLTAGE LIST**

	B	C	E		B	C	E
Q2772	1.5	7.1	0.9	Q3781	2.2	3.9	2.9
Q3710	1.8	0.0	2.5	Q3782	3.3	9.0	3.9
Q3711	5.0	5.6	4.4	Q3783	2.1	9.0	2.7
Q3712	0.0	0.0	0.0	Q3901	0.9	67.0	0.4
Q3761	2.2	3.8	2.9	Q3902	134.0	67.0	134.0
Q3762	3.1	9.0	3.8	Q3903	1.8	5.4	2.4
Q3763	2.0	9.0	2.6	Q3904	1.8	9.0	2.4
Q3771	2.2	3.8	2.9	Q3905	5.7	GND	5.4
Q3772	3.2	9.0	3.8	Q3906	5.7	9.0	6.1
Q3773	2.0	9.0	2.6	Q3907	5.3	9.1	5.9
				Q3908	4.9	0.0	5.3

All voltages are in V.

**D BOARD SCHEMATIC DIAGRAM (ALL EXCEPT KV-27FA310/29FA310)**


**HS BOARD SCHEMATIC DIAGRAM  
(ALL EXCEPT KV-27FA310/29FA310)**

**V BOARD SCHEMATIC DIAGRAM**


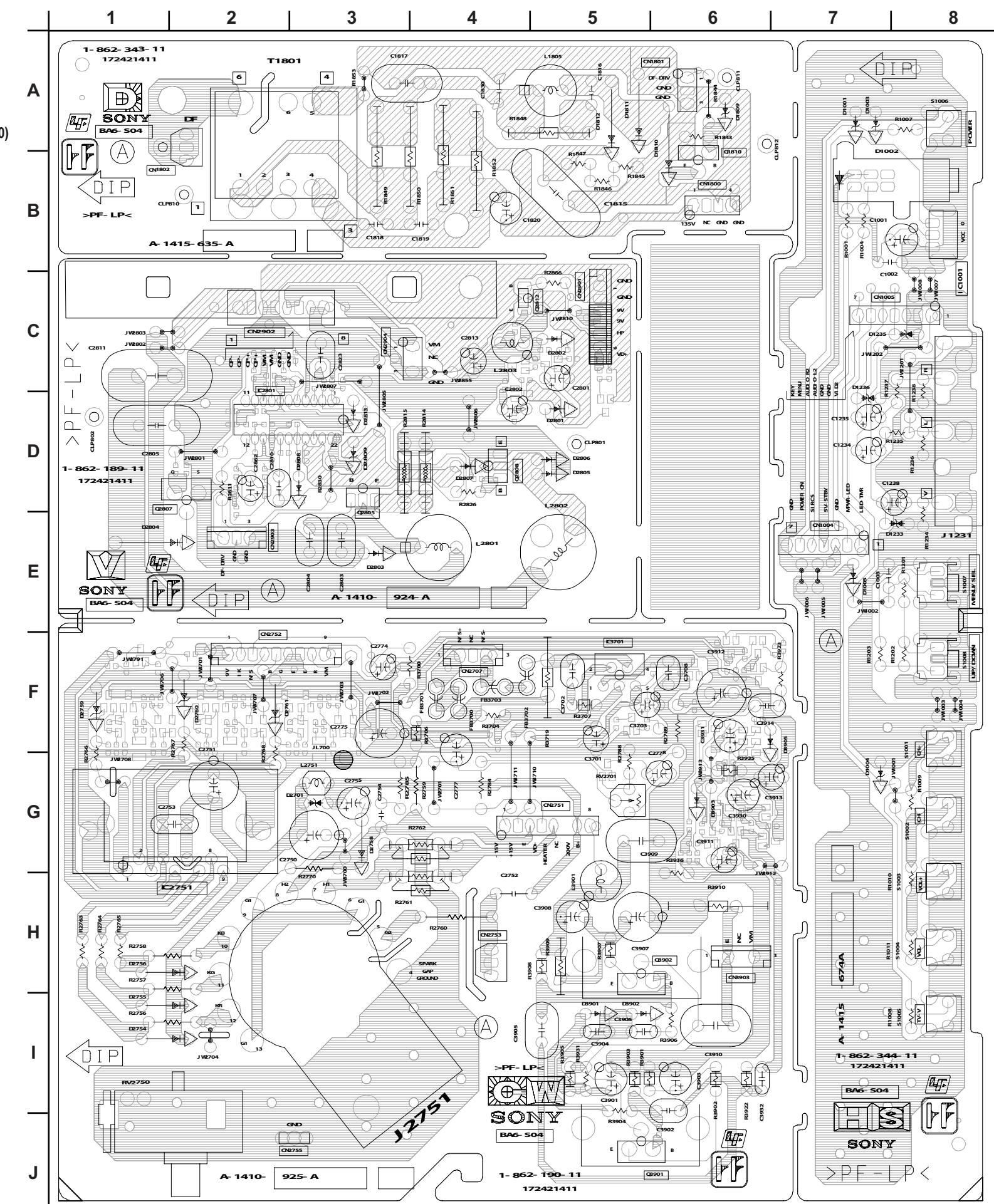
**CW** [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]

## D [DEFLECTION] (ALL EXCEPT KV-27FA310/29FA310)

**HS** [IR DETECTOR, FRONT VIDEO2] (ALL EXCEPT KV-27FA310/29FA310)

## V [VELOCITY MODULATION]

## COMPONENT SIDE



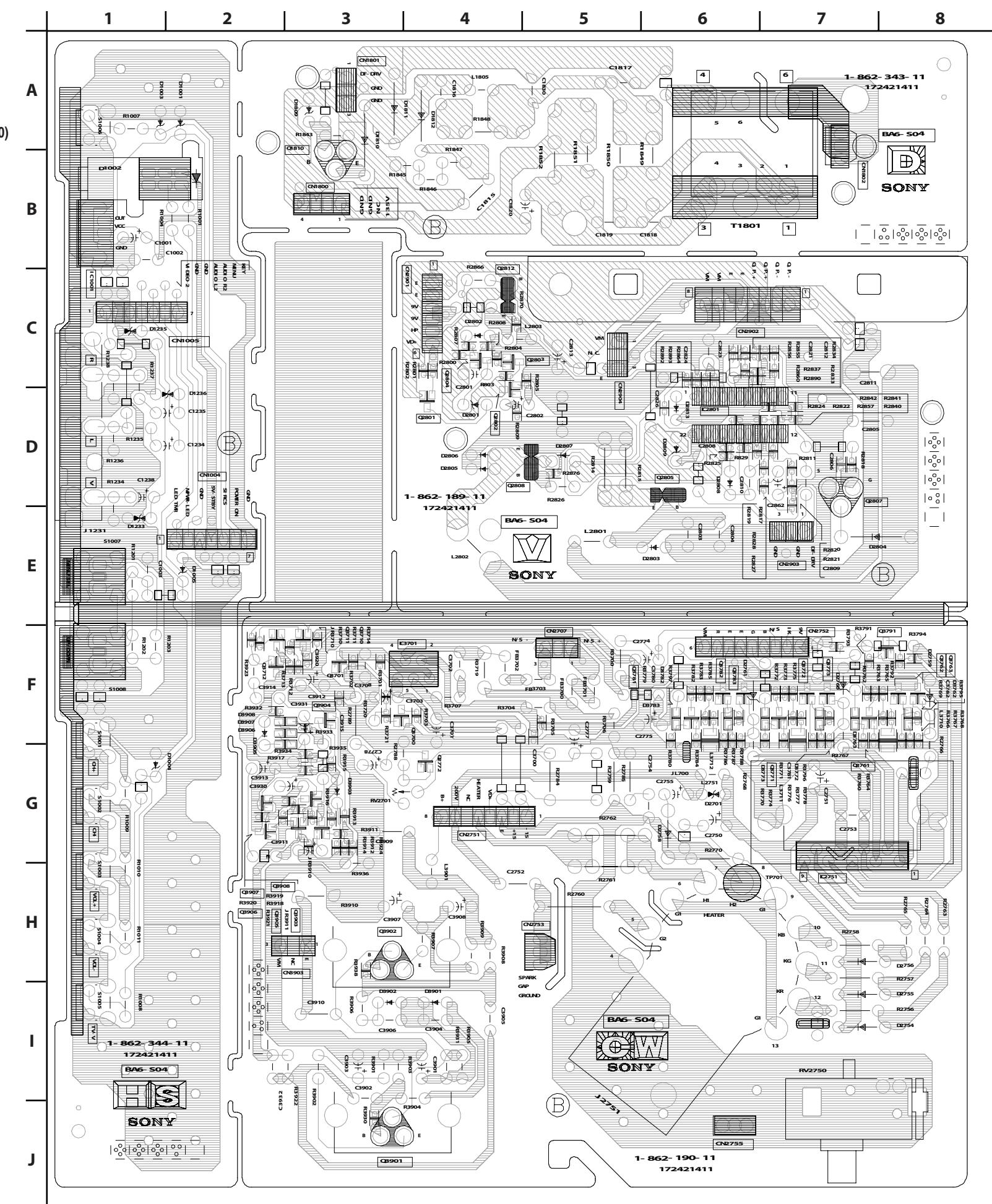
**CW** [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]

**D** [DEFLECTION] (ALL EXCEPT KV-27FA310/29FA310)

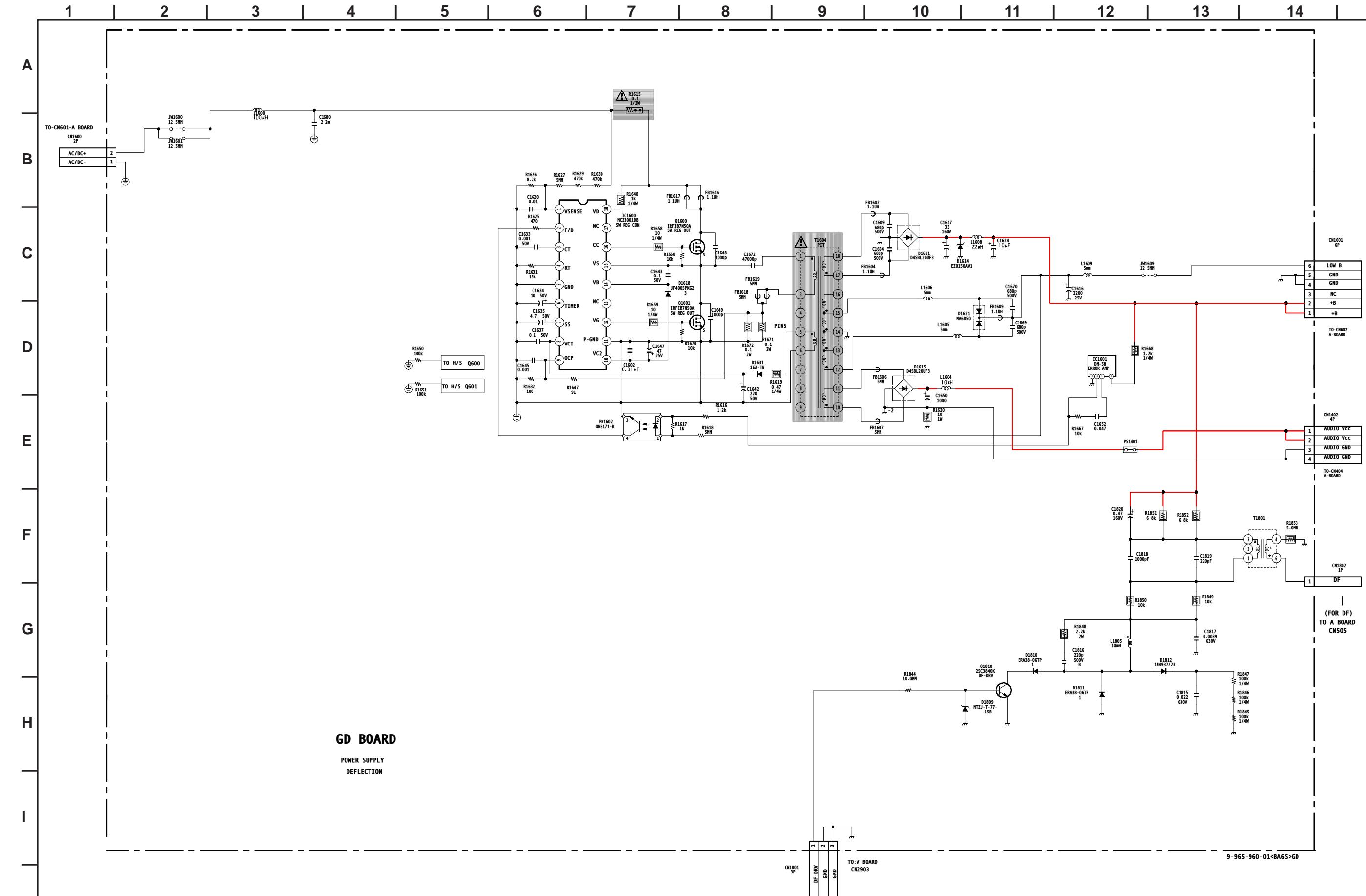
**HS** [IR DETECTOR, FRONT VIDEO2] (ALL EXCEPT KV-27FA310/29FA310)

**V** [VELOCITY MODULATION]

CONDUCTOR SIDE



GD BOARD SCHEMATIC DIAGRAM (KV-27FA310/29FA310 ONLY)



## GD BOARD IC VOLTAGE LIST

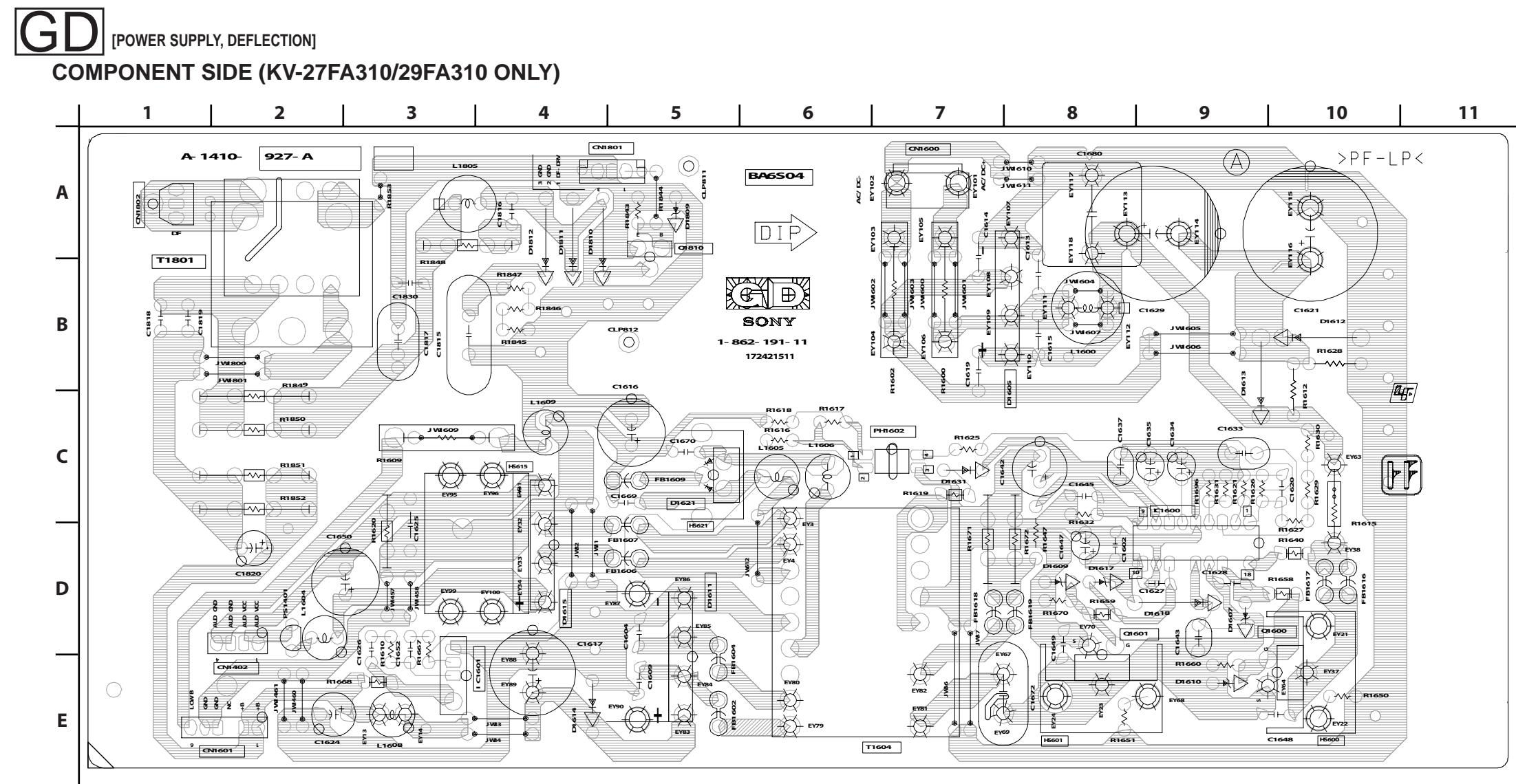
IC1600		IC1601	
PIN	VOLT	PIN	VOLT
1	2.5	1	133.7
2	1.8	2	N/C
3	2.2	3	2.5
4	2.5	4	11.3
5	GND	5	GND
6	0.0	All voltages are in V.	
7	4.0		
8	17.2		
9	GND		
10	10.4		
11	0.0		
12	4.6		
13	N/C		
14	163.6		
15	153.5		
16	157.6		
17	N/C		
18	340.0		

All voltages are in V.

## GD BOARD TRANSISTOR VOLTAGE LIST

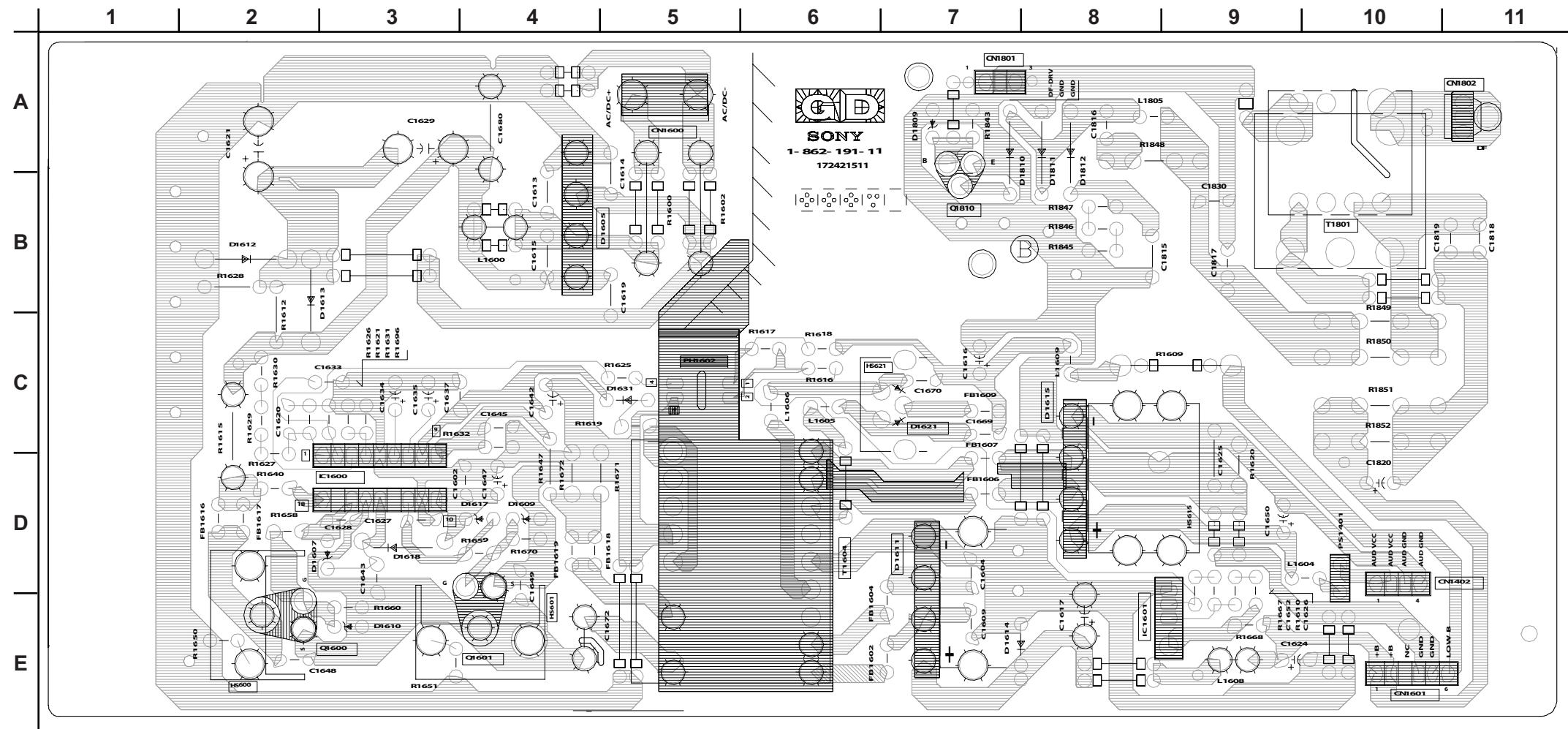
	D	G	S
<b>Q1600</b>	313.0	160.0	156.0
<b>Q1601</b>	155.0	4.9	0.0

All voltages are in V.

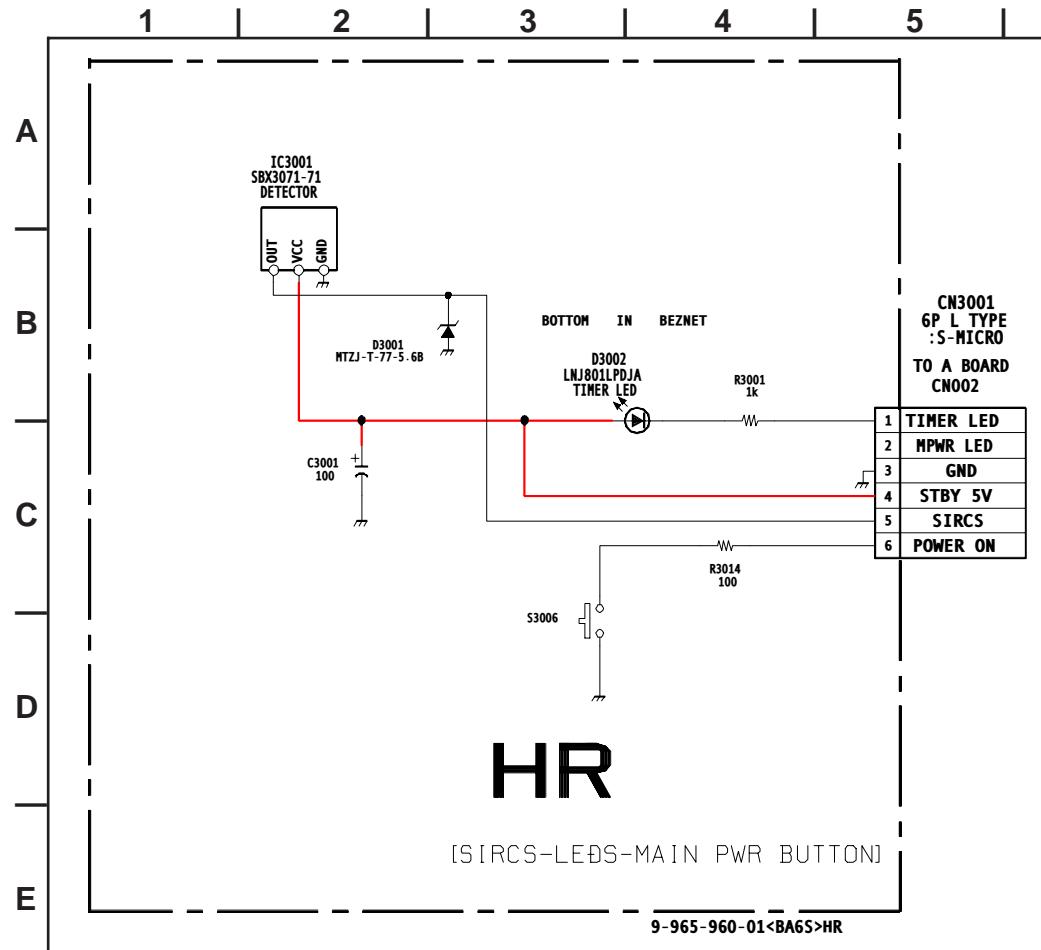


**GD** [POWER SUPPLY, DEFLECTION]

## **CONDUCTOR SIDE (KV-27FA310/29FA310 ONLY)**



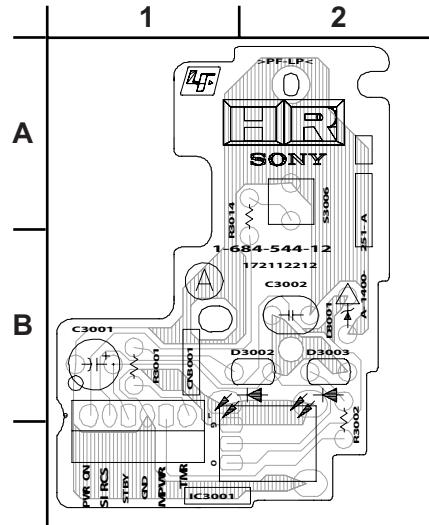
## HR BOARD SCHEMATIC DIAGRAM (KV-27FA310/29FA310 ONLY)





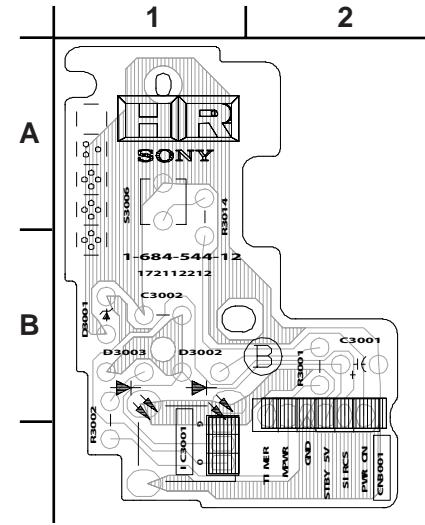
[SIRC, LEDS, MAIN POWER BUTTON]

## COMPONENT SIDE (KV-27FA310/29FA310 ONLY)

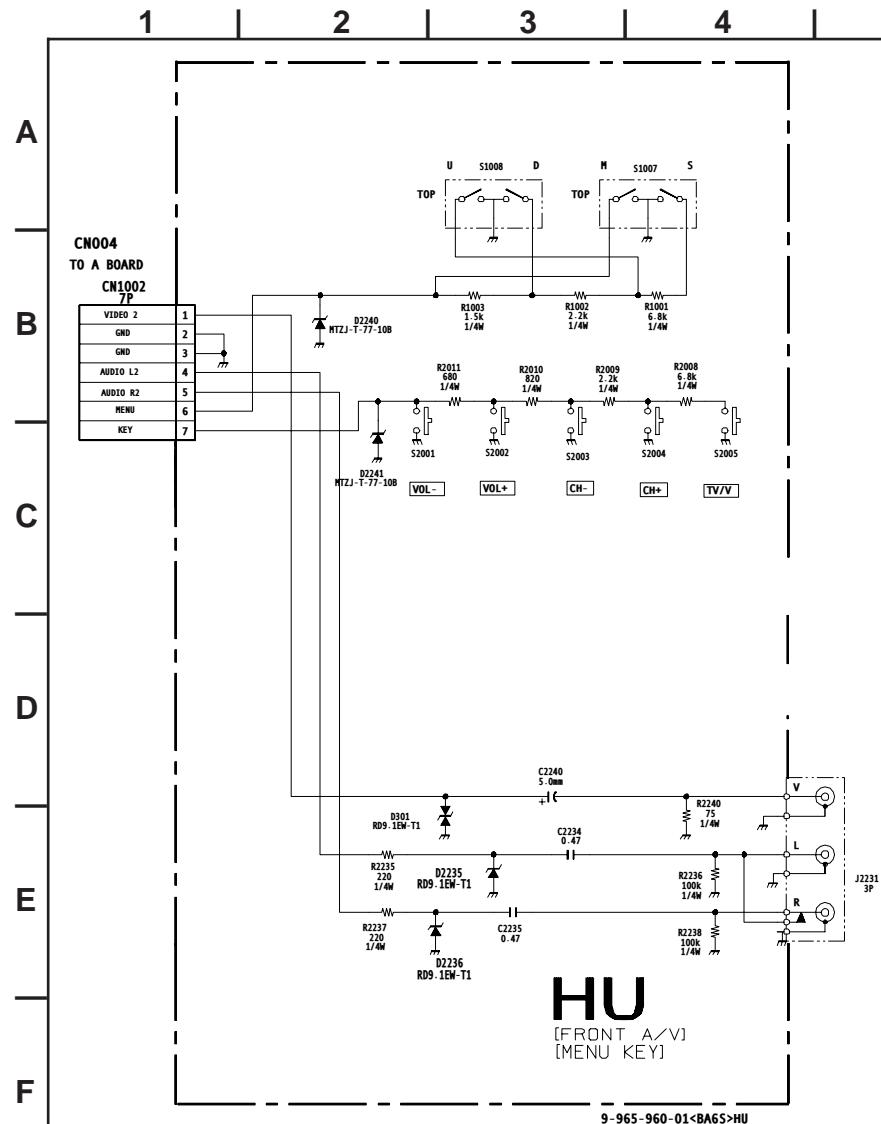


[SIRC, LEDS, MAIN POWER BUTTON]

## CONDUCTOR SIDE (KV-27FA310/29FA310 ONLY)



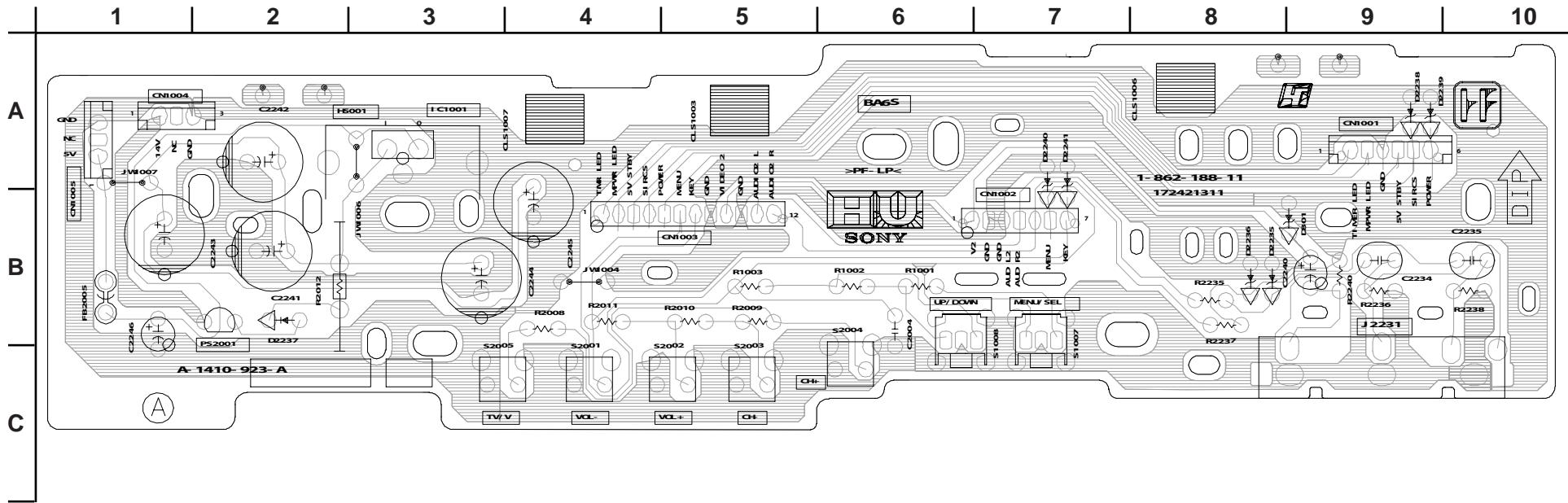
## HU BOARD SCHEMATIC DIAGRAM (KV-27FA310/29FA310 ONLY)



**HU**

[FRONT A/V, MENU KEY]

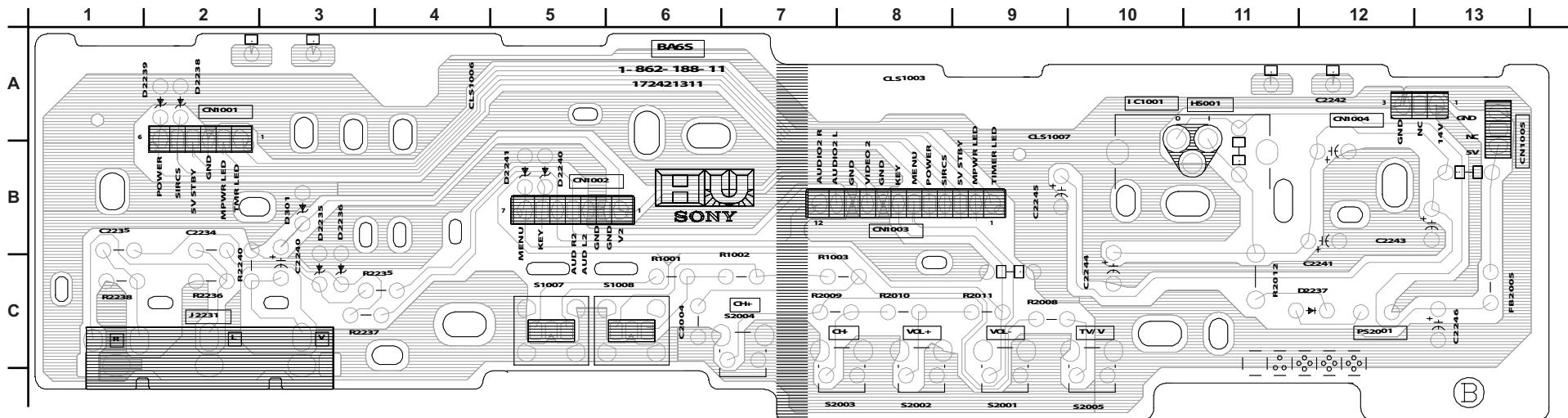
## **COMPONENT SIDE (KV-27FA310/29FA310 ONLY)**



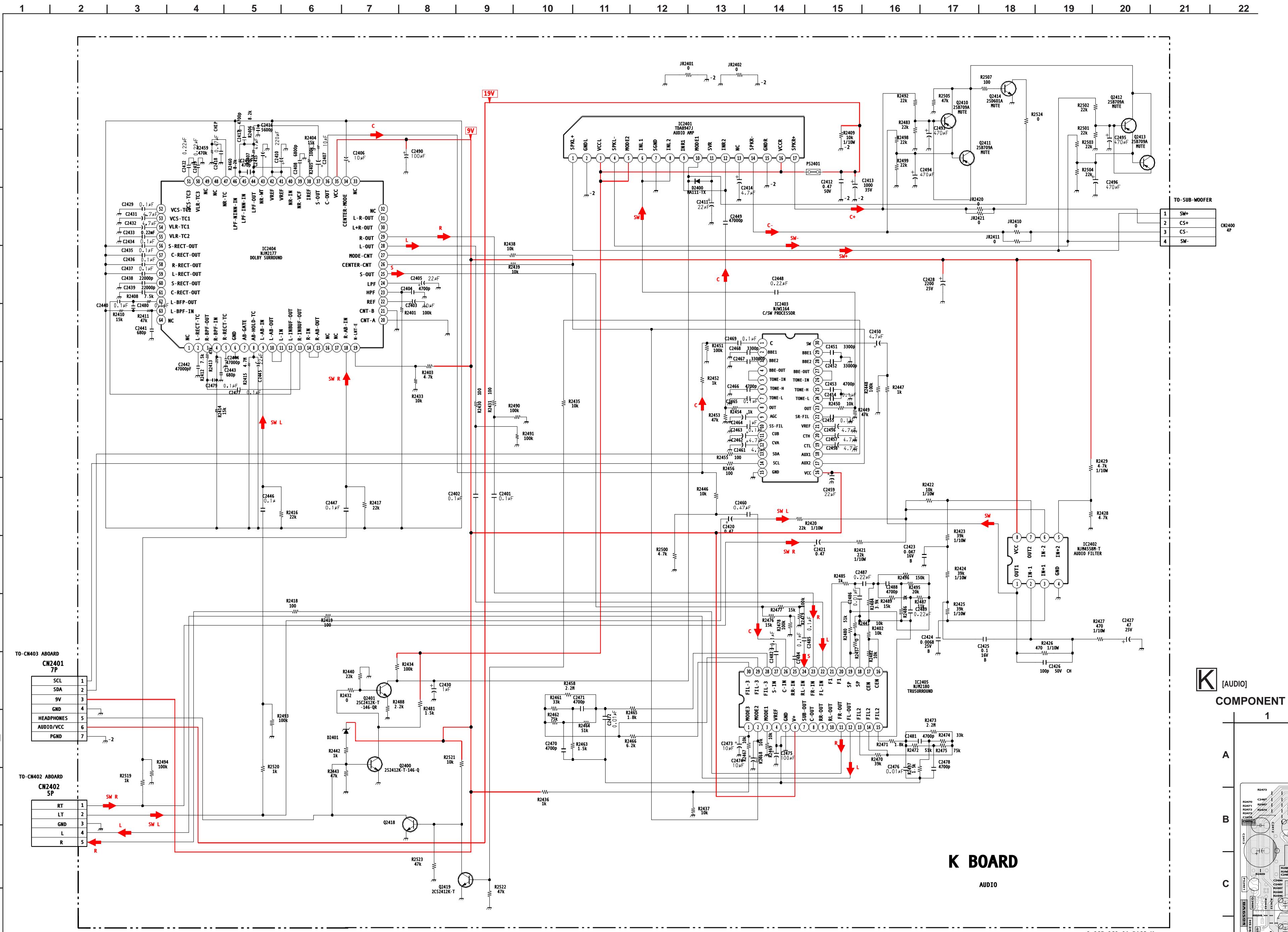
HU

### [FRONT A/V, MENU KEY]

## **CONDUCTOR SIDE (KV-27FA310/29FA310 ONLY)**



## K BOARD SCHEMATIC DIAGRAM (KV-27FA310/29FA310 ONLY)



## K BOARD IC VOLTAGE LIST

IC2401		IC2403		29	4.5	25	4.0	54	4.0	17	4.5
1	8.3	1	4.5	30	4.5	27	4.37	56	4.0	19	4.5
2	GND	2	4.5			28	4.0	57	4.0	20	4.5
3	19.6	3	4.5			29	4.0	58	4.0	21	4.5
4	8.3	4	4.5	1	n/c	30	n/c	59	4.0	22	4.5
5	19.6	5	4.5	2	n/c	31	n/c	60	4.0	23	4.5
6	3.2	6	4.5	3	4.0	32	n/c	61	4.0	24	4.5
7	GND	7	4.5	4	4.0	33	n/c	62	4.0	25	4.5
8	0.0	8	4.5	5	4.0	34	4.0	63	4.0	26	4.5
9	3.2	9	1.0	6	GND	35	9.0	64	n/c	27	4.5
10	9.1	10	4.5	7	n/c	36	4.0	IC2405	28	4.5	
11	9.7	11	3.4	8	3.8	37	4.0		29	4.5	
12	3.2	12	3.3	9	4.0	38	1.45	1	7.7	30	4.5
13	3.3	13	4.5	10	4.0	39	4.0	2	4.6		
14	8.3	14	4.5	11	4.0	40	4.0	3	0.0		
15	GND	15	GND	12	4.0	41	4.0	4	4.5		
16	19.6	16	9.0	13	4.0	42	4.0	5	0.0		
17	9.3	17	4.9	14	4.0	43	4.0	6	9.0		

All voltages are in V.

## K BOARD

AUDIO

## K BOARD TRANSISTOR VOLTAGE LIST

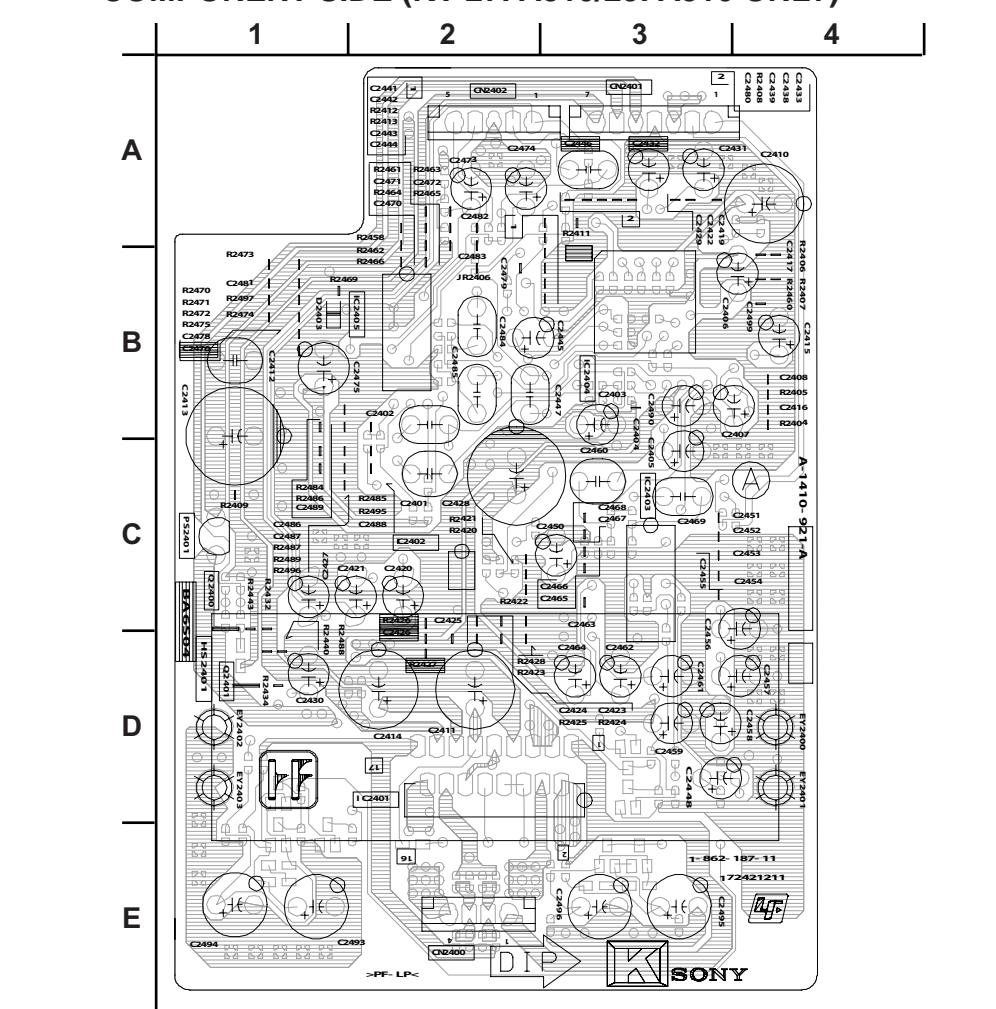
	B	C	E
Q2400	0.7	0.0	GND
Q2401	0.0	17.9	0.0
Q2410	4.8	0.0	4.8
Q2411	4.8	0.0	4.8
Q2412	4.8	0.0	4.9
Q2413	4.8	0.0	4.9
Q2414	0.0	0.2	GND
Q2418	0.0	0.7	GND
Q2419	0.0	0.0	GND

All voltages are in V.

K

[AUDIO]

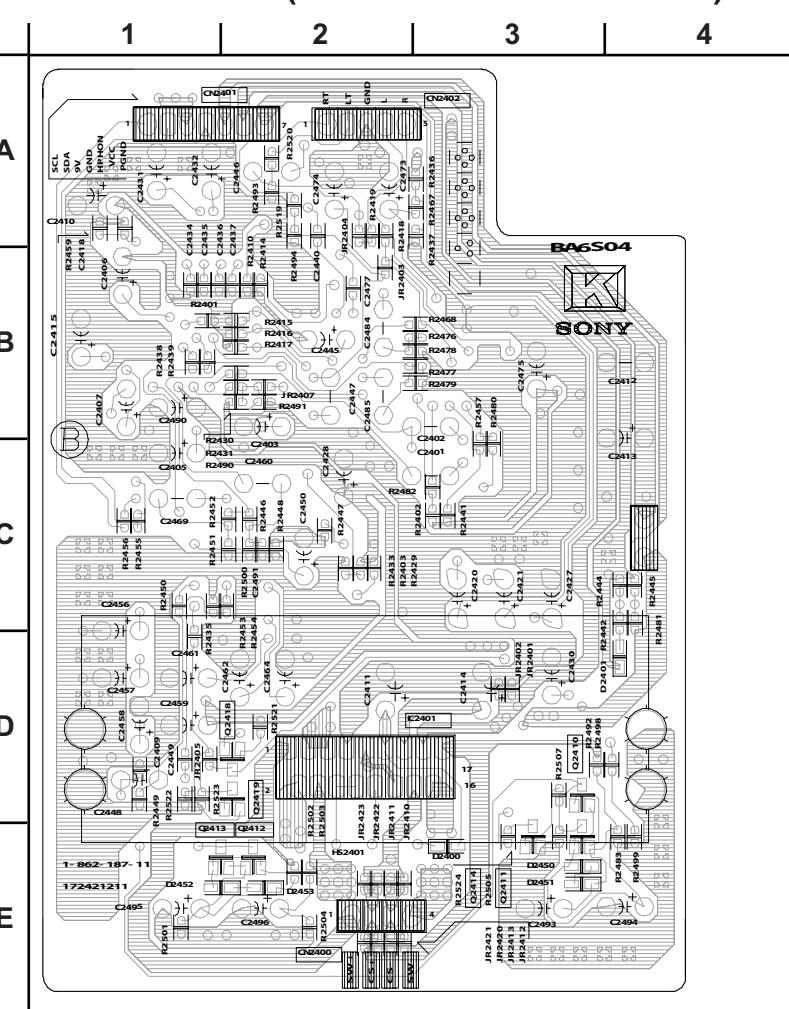
## COMPONENT SIDE (KV-27FA310/29FA310 ONLY)



K

[AUDIO]

## CONDUCTOR SIDE (KV-27FA310/29FA310 ONLY)



## 5-4. SEMICONDUCTORS

2SB709A-QRS-TX 2SD601A-QRS-TX	2SB734-T-34 2SC3209LK-TP	2SA1309A-QRSTA 2SC3311A-QRSTA 2SD2144S-TP-UVW	2SC3840K	2SA1837
2SA10910-TPE2	IRF614	2SK2663	2SC4793	2SD2578-YB
ERA38-06TP1 ERA82-004TP5 1SS133T-77 D1NS0R-TA MTZJ-T-77-12C MTZJ-T-77-15B MTZJ-T-77-33B MTZJ-T-77-39	RU-1P ERC06-15S EGP20DPKG23 MTZJ-T-77-5.1C MTZJ-T-77-5.6C MTZJ-T-77-7.5A MTZJ-T-77-10B MTZJ-T-77-30D RGP10-GPKG3 RGP02-17PKG23 RGP15GPKG23	ERB44-06TP1 1SS83TD GP08DPKG23 RGP10GPKG23 RU4AM-T3	RD9.1EW-T1	MA111-TX UDZ-TE-17.5.1B UDZ-TE-17.91B
D2SB60A-F04	DAP202K-T-146	D4SB60L-F		
D5LC20U	TF541M			

## SECTION 6: EXPLODED VIEWS

Components not identified by a part number or description are not stocked because they are seldom required for routine service.

The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

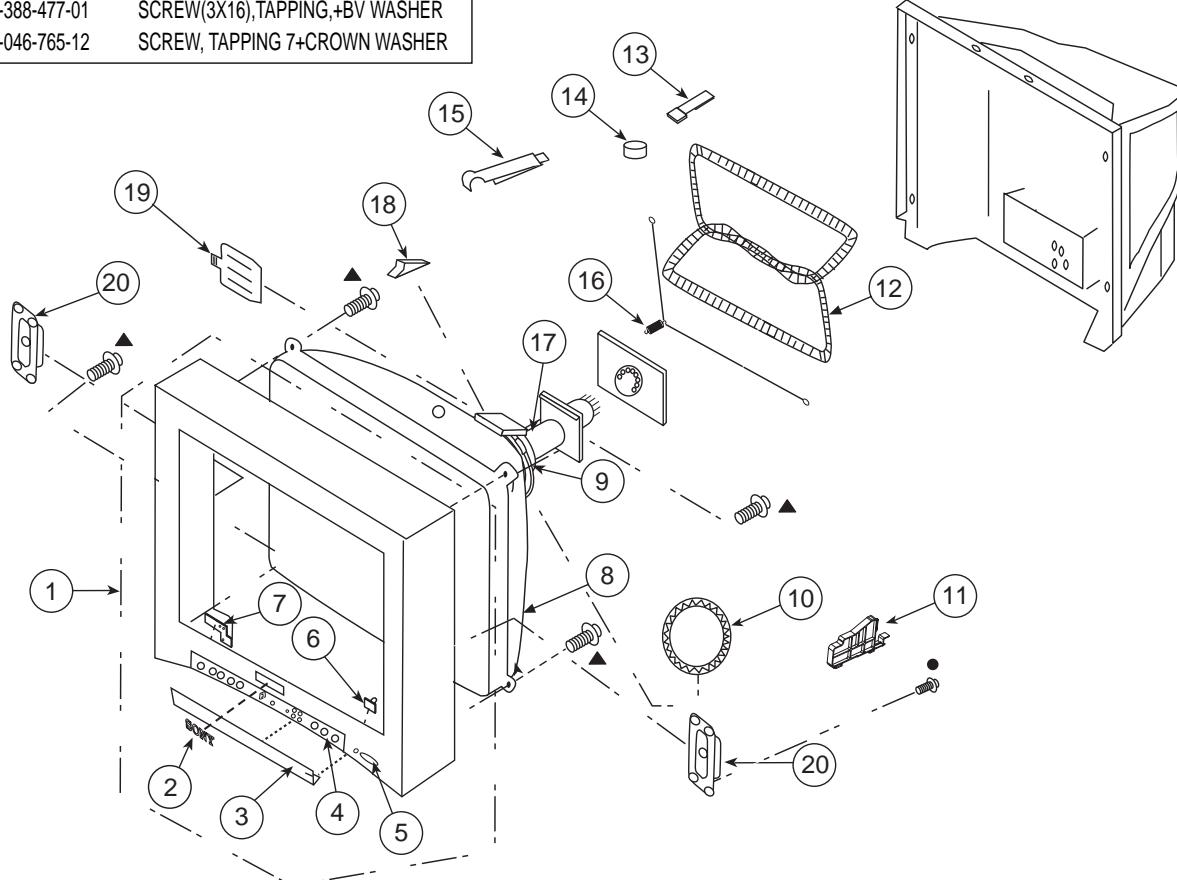
\* Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

## 6-1. PICTURE TUBE (KV-27FS120/29FS120 ONLY)

- 4-388-477-01 SCREW(3X16),TAPPING,+BV WASHER
- ▲ 4-046-765-12 SCREW, TAPPING 7+CROWN WASHER



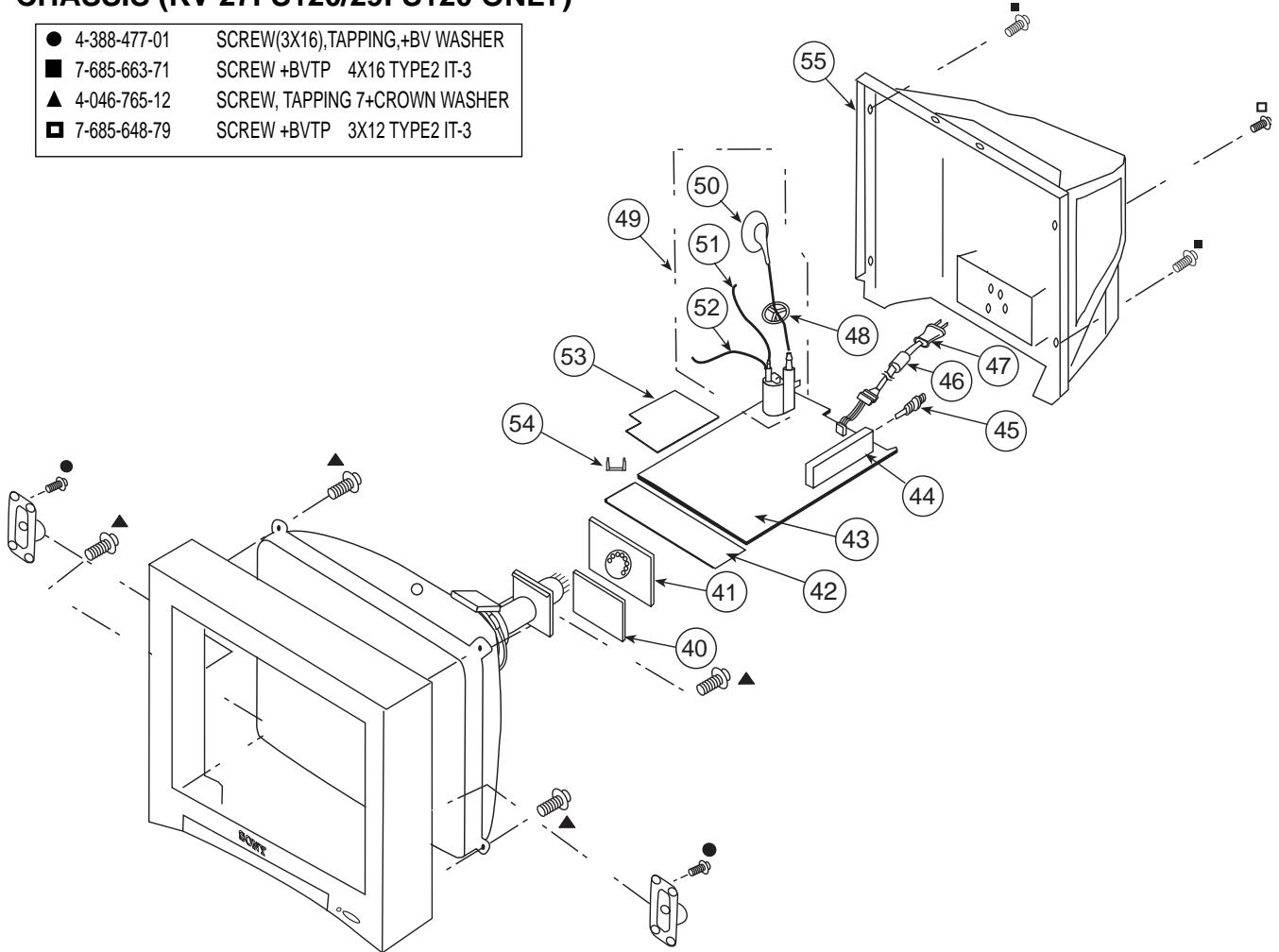
REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]	REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	X-4043-163-1	BEZNET, ASSY	[2-7]	11	4-089-062-02	SUPPORTER, CRT	
2	4-046-160-31	EMBLEM, SONY NO.9		▲ 12	1-419-156-21	COIL, DEGAUSSING (ALL EXCEPT KV-29FS120 L. SOUTH)	
3	4-089-056-11	DOOR		▲ 12	1-419-523-21	COIL, DEGAUSSING (KV-29FS120 L. SOUTH ONLY)	
4	4-089-016-01	LABEL, DOOR		13	4-083-414-01	PIECE A(110), CONV CORRECT	
5	4-089-057-11	BUTTON, POWER		14	1-452-885-11	MAGNET, LANDING	
6	4-089-058-01	GUIDE, LED		* 15	4-062-970-12	CLIP (29RSN), DGC	
* 7	4-083-303-01	SPRING, METAL		16	4-036-329-01	SPRING (B), TENSION	
▲ 8	8-735-082-05	CRT 29RSN(SDP) (ALL EXCEPT KV-29FS120 L. SOUTH)		▲ 17	8-453-011-11	NECK ASSEMBLY 299-M	
▲ 8	8-735-083-05	CRT 29RSN(SDP)(SOUTH) (KV-29FS120 L. SOUTH ONLY)		18	4-053-005-01	SPACER, DY	
▲ 9	8-451-494-41	DY Y29RSA-V		19	4-081-170-01	PLATE, TLH CORRECTION	
▲ 10	1-452-896-11	COIL, NA ROTATION (RT-200)		20	1-825-206-11	LOUDSPEAKER (6X12CM)	

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

## 6-2. CHASSIS (KV-27FS120/29FS120 ONLY)

● 4-388-477-01	SCREW(3X16),TAPPING,+BV WASHER
■ 7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
▲ 4-046-765-12	SCREW, TAPPING 7+CROWN WASHER
■ 7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 40	A-1410-924-A	V BOARD, MOUNTED	
* 41	A-1410-925-A	CW BOARD, MOUNTED	
* 42	A-1415-674-A	HS BOARD, MOUNTED	
* 43	A-1052-931-A	A BOARD, COMPLETE (KV-29FS120 L. SOUTH ONLY)	
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 50-52)	
* 43	A-1302-967-A	A BOARD, COMPLETE (ALL EXCEPT KV-29FS120 L. SOUTH)	
		The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 50-52)	
△ 44	8-598-593-50	TUNER, FSS BTF-WA421	
△ 45	1-766-374-11	PLUG, F-PIN	
46	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-29FS120 L. SOUTH ONLY)	

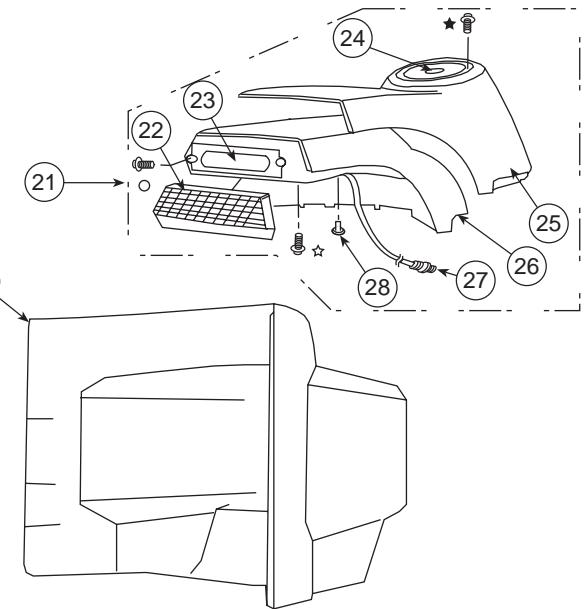
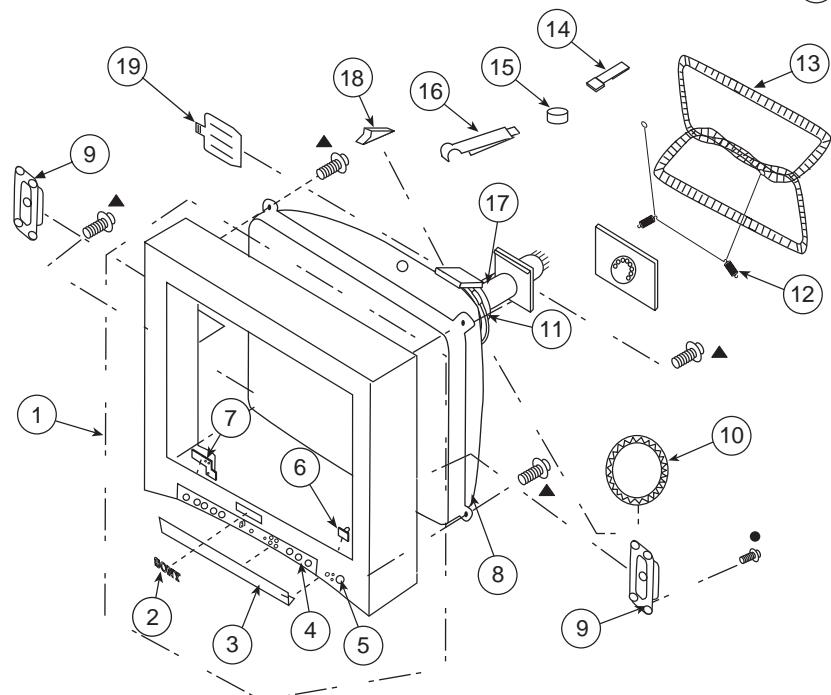
REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
△ 47	1-824-069-11	CORD, AC POWER (WITH CONNECTOR) (ALL EXCEPT KV-29FS120 L. SOUTH)	
△ 47	1-757-840-12	CORD, POWER (WITH CONNECTOR) (KV-29FS120 L. SOUTH ONLY)	
48	4-084-918-01	HOLDER, HV CABLE	
△ 49	1-453-310-21	FBT ASSY NX-4521//X4J4	[50-52]
△ 50	1-251-374-14	CAP ASSY, HIGH-VOLTAGE	
△ 51	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	
△ 52	1-900-803-22	WIRE ASSY, G2 LEAD	
* 53	A-1415-635-A	D BOARD, MOUNTED	
* 54	3-696-606-02	HINGE, VI	
55	4-089-050-32	COVER, REAR	

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

### 6-3. PICTURE TUBE (KV-27FA310/29FA310 ONLY)

● 4-388-477-01	SCREW(3X16),TAPPING,+BV WASHER
▲ 4-046-765-12	SCREW, TAPPING 7+CROWN WASHER
☆ 7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
★ 7-685-661-14	SCREW +BVTP 4X12 TYPE2 IT-3
○ 4-384-096-01	SCREW (4X16), TAPPING, +P



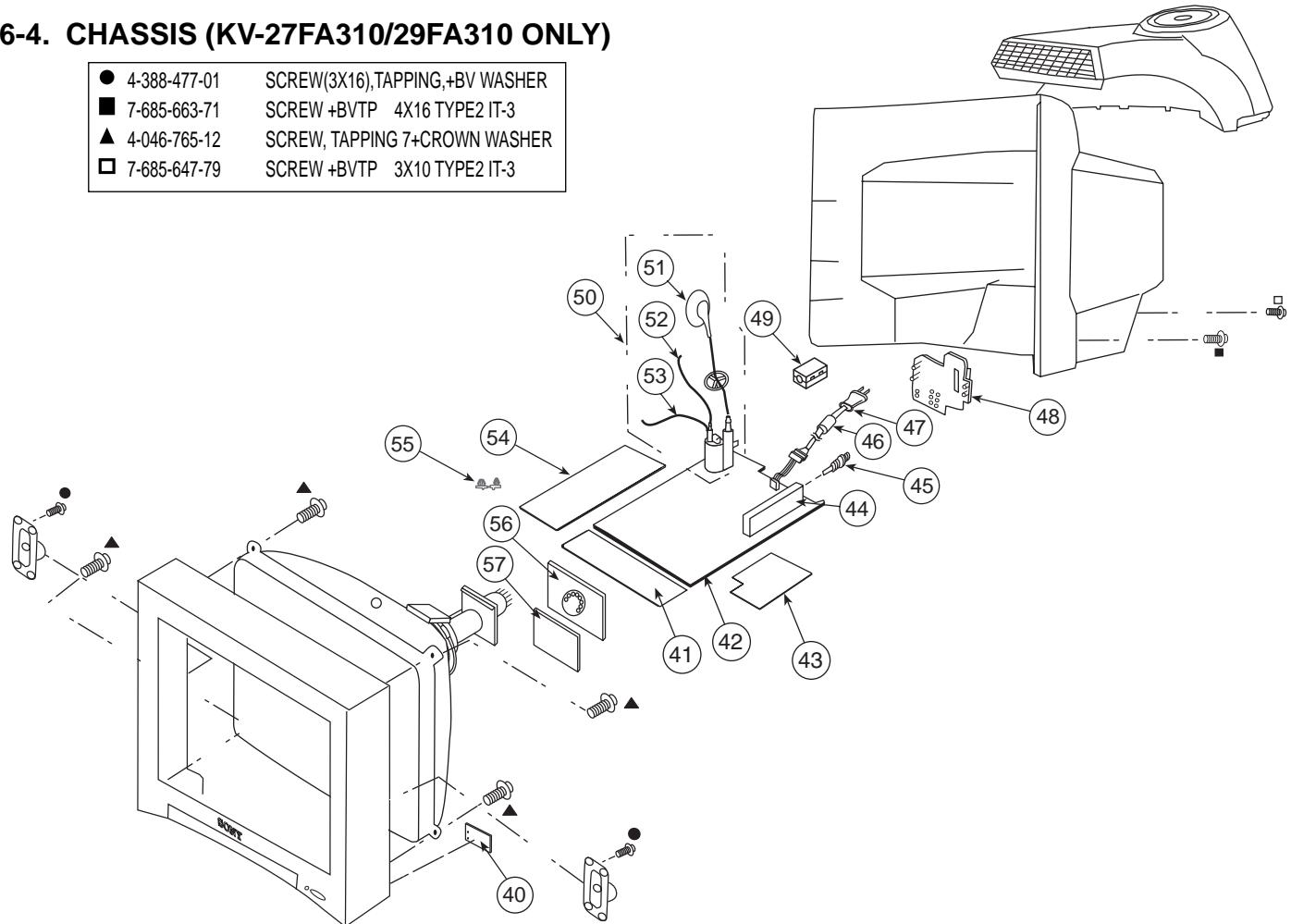
REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]	REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
1	X-4043-169-2	BEZNET ASSY (KV-27FA310 ONLY)	[2-7]	△ 13	1-419-523-21	COIL, DEGAUSSING (KV-29FA310 L. SOUTH ONLY)	
1	X-4043-169-1	BEZNET ASSY (KV-29FA310 ONLY)	[2-7]	14	4-083-414-01	PIECE A(110), CONV CORRECT	
2	4-046-160-31	EMBLEM, SONY NO.9		15	1-452-885-11	MAGNET, LANDING	
* 3	4-087-375-31	DOOR, CONTROL		* 16	4-062-970-12	CLIP (29RSN), DGC	
4	4-087-376-21	LABEL, FRONT TERMINAL		△ 17	8-453-011-11	NECK ASSEMBLY 299-M	
5	4-087-150-41	BUTTON, POWER		18	4-053-005-01	SPACER, DY	
6	4-087-156-01	GUIDE, LIGHT		19	4-081-170-01	PLATE, TLH CORRECTION	
7	4-087-374-11	SPRING, DOOR		20	4-093-996-12	COVER, REAR (KV-27FA310 ONLY)	
△ 8	8-735-082-05	CRT 29RSN(SDP) M68LNH050X (KV-27FA310 & KV-29FA310 L. NORTH ONLY)		20	4-093-996-11	COVER, REAR (KV-29FA310 ONLY)	
△ 8	8-735-083-05	CRT 29RSN(SDP)(SOUTH) (KV-29FA310 L. SOUTH ONLY)		21	A-1606-603-A	SPEAKER ASSY (29)	[22-28]
9	1-825-417-21	LOUDSPEAKER (16X12CM)		* 22	4-101-820-01	GRILLE, CENTER (W29)	
△ 10	1-452-896-11	COIL, NA ROTATION (RT-200)		23	1-825-809-11	LOUDSPEAKER (19.2CMX4.2CM)	
△ 11	8-451-494-41	DY Y29RSA-V		24	1-825-807-11	LOUDSPEAKER (13CM)	
12	4-036-329-01	SPRING (B), TENSION		* 25	X-2022-510-1	TOP ASSY (W29), COVER	
△ 13	1-419-156-22	COIL, DEGAUSSING (KV-27FA310 ONLY)		* 26	4-101-830-01	COVER, BOTTOM (W29)	
△ 13	1-419-156-21	COIL, DEGAUSSING (KV-29FA310 L. NORTH ONLY)		* 27	1-828-903-11	CONNECTION CABLE	
				* 28	4-068-528-41	FOOT	

**NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.**

**NOTE:** Les composants identifies per un trame et une marque  sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

#### 6-4. CHASSIS (KV-27FA310/29FA310 ONLY)

● 4-388-477-01	SCREW(3X16),TAPPING,+BV WASHER
■ 7-685-663-71	SCREW +BVTP 4X16 TYPE2 IT-3
▲ 4-046-765-12	SCREW, TAPPING 7+CROWN WASHER
□ 7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3



REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]	REF. NO.	PART NO.	DESCRIPTION	[ASSEMBLY INCLUDES]
* 40	A-1415-629-A	HR (VAR) BOARD, MOUNTED		⚠ 47	1-757-840-12	CORD, POWER (WITH CONNECTOR)	
** 41	A-1415-631-A	HU (VAR) BOARD, MOUNTED				(KV-29FA310 L. SOUTH ONLY)	
* 42	A-1302-880-A	A BOARD, COMPLETE (KV-27FA310 & KV-29FA310 L. NORTH ONLY)	The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 51-53)	* 48	4-087-877-41	TERMINAL BRACKET	
				49	1-500-082-11	CLAMP, SLEEVE FERRITE	
* 42	A-1302-954-A	A BOARD, COMPLETE (KV-29FA310 L. SOUTH ONLY)	The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. (See 51-53)	⚠ 50	1-453-310-21	FBT ASSY NX-4521//X4J4	[51-53]
				⚠ 51	1-251-374-14	CAP ASSY, HIGH-VOLTAGE	
* 43	A-1410-921-A	K BOARD, MOUNTED		⚠ 52	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	
⚠ 44	8-598-593-50	TUNER, FSS BTF-WA421		⚠ 53	1-900-803-22	WIRE ASSY, G2 LEAD	
⚠ 45	1-766-374-11	PLUG, F-PIN		* 54	A-1410-927-A	GD (COM) BOARD, MOUNTED	
46	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (KV-29FA310 L. SOUTH ONLY)		* 55	4-076-951-01	HINGE, PWB	
⚠ 47	1-824-069-11	CORD, AC POWER (WITH CONNECTOR) (KV-27FA310 & KV-29FA310 L. NORTH ONLY)		* 56	A-1410-925-A	CW BOARD, MOUNTED	
				* 57	A-1410-924-A	V BOARD, MOUNTED	

## SECTION 7: ELECTRICAL PARTS LIST

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

The components in this manual identified by the following symbol:  indicate parts that have been carefully factory-selected to satisfy regulations regarding X-ray radiation for each set.

Should replacement be required for one of these components, replace only with the value originally used.

**A**

## RESISTORS

- All resistors are in ohms
- F : nonflammable
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

When ordering parts by reference number, please include the board name.

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES					
<b>A</b>			C023	1-126-935-11	ELECT	470 $\mu$ F	20%	16V	C033	1-162-970-11	CERAMIC CHIP	0.01 $\mu$ F	10%	25V
*	<b>A-1052-931-A</b>	<b>A BOARD, COMPLETE</b>	C041	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C047	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
(KV-29FS120LS ONLY)			C048	1-104-665-11	ELECT	100 $\mu$ F	20%	25V	C049	1-126-960-11	ELECT	1 $\mu$ F	20%	50V
*	<b>A-1302-880-A</b>	<b>A BOARD, COMPLETE</b>	C051	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C052	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
(KV-27FA310/29FA310LN ONLY)			C053	1-165-176-11	CERAMIC CHIP	0.047 $\mu$ F	10%	16V	C054	1-126-960-11	ELECT	1 $\mu$ F	20%	50V
*	<b>A-1302-954-A</b>	<b>A BOARD, COMPLETE</b>	C056	1-162-966-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V	C057	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
(KV-29FA310LS ONLY)			C064	1-165-176-11	CERAMIC CHIP	0.047 $\mu$ F	10%	16V	C074	1-126-964-11	ELECT	10pF	20%	50V
*	<b>A-1302-967-A</b>	<b>A BOARD, COMPLETE</b>	C075	1-126-935-11	ELECT	470 $\mu$ F	20%	16V	C076	1-104-665-11	ELECT	100 $\mu$ F	20%	25V
(KV-27FS120/29FS120LN ONLY)			C077	1-126-947-11	ELECT	47 $\mu$ F	20%	35V	C079	1-162-968-11	CERAMIC CHIP	0.0047 $\mu$ F	10%	50V
 1-533-223-11	FUSE HOLDER	0A 0V	C080	1-128-934-91	CERAMIC CHIP	0.33 $\mu$ F	20%	10V	C081	1-128-934-91	CERAMIC CHIP	0.33 $\mu$ F	20%	10V
*	4-374-846-11	COVER, CAPACITOR, CAP TYPE	C090	1-162-970-11	CERAMIC CHIP	0.01 $\mu$ F	10%	25V	C091	1-126-947-11	ELECT	47 $\mu$ F	20%	35V
4-382-854-11	SCREW (M3X10), P, SW (+)		C092	1-126-947-11	ELECT	47 $\mu$ F	20%	35V	C094	1-162-970-11	CERAMIC CHIP	0.01 $\mu$ F	10%	25V
The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. Order the following leads when requesting this A Board:			C095	1-126-947-11	ELECT	47 $\mu$ F	20%	35V	C096	1-162-970-11	CERAMIC CHIP	0.01 $\mu$ F	10%	25V
 1-251-374-14	CAP ASSY, HIGH-VOLTAGE		C097	1-126-947-11	ELECT	47 $\mu$ F	20%	35V	C098	1-162-970-11	CERAMIC CHIP	0.01 $\mu$ F	10%	25V
 1-900-803-22	WIRE ASSY, G2 LEAD		C099	1-126-947-11	ELECT	47 $\mu$ F	20%	35V	C100	1-126-956-91	ELECT	0.1 $\mu$ F	20%	50V
 1-900-800-65	CONNECTOR ASSY, FOCUS LEAD		C115	1-164-739-11	CERAMIC CHIP	560pF	5%	50V	C116	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
<b>CAPACITOR</b>			C120	1-126-960-11	ELECT	1 $\mu$ F	20%	50V	C200	1-125-891-11	CERAMIC CHIP	0.47 $\mu$ F	10%	10V
C003	1-162-919-11	CERAMIC CHIP	C004	1-162-923-11	CERAMIC CHIP	22pF	5%	50V	C202	1-125-891-11	CERAMIC CHIP	0.47 $\mu$ F	10%	10V
C005	1-162-966-11	CERAMIC CHIP	C006	1-126-942-61	ELECT	47pF	5%	50V	C203	1-125-891-11	CERAMIC CHIP	0.47 $\mu$ F	10%	10V
C007	1-164-315-11	CERAMIC CHIP	C008	1-126-956-91	ELECT	0.0022 $\mu$ F	10%	50V	C117	1-126-947-11	ELECT	0.001 $\mu$ F	10%	25V
C009	1-164-230-11	CERAMIC CHIP	C010	1-126-960-11	ELECT	1000 $\mu$ F	20%	25V	C118	1-126-947-11	ELECT	0.001 $\mu$ F	10%	25V
C011	1-162-964-11	CERAMIC CHIP	C012	1-162-968-11	CERAMIC CHIP	1 $\mu$ F	20%	50V	C119	1-126-947-11	ELECT	0.001 $\mu$ F	10%	25V
C014	1-126-960-11	ELECT	C015	1-107-826-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C120	1-126-947-11	ELECT	0.001 $\mu$ F	10%	25V
C019	1-126-956-91	ELECT	C021	1-107-826-11	CERAMIC CHIP	0.0047 $\mu$ F	10%	16V	C121	1-126-947-11	ELECT	0.001 $\mu$ F	10%	25V
C022	1-126-964-11	ELECT	C023	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C122	1-126-947-11	ELECT	0.001 $\mu$ F	10%	25V

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

**A**

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
C204	1-216-864-11	SHORT CHIP				C419	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C205	1-216-864-11	SHORT CHIP				C420	1-126-960-11	ELECT	1µF	20%	50V
C206	1-126-963-11	ELECT	4.7µF	20%	50V	C421	1-126-965-91	ELECT	22µF	20%	50V
C207	1-126-963-11	ELECT	4.7µF	20%	50V	C422	1-126-960-11	ELECT	1µF	20%	50V
C212	1-126-963-11	ELECT	4.7µF	20%	50V	C423	1-126-963-11	ELECT	4.7µF	20%	50V
C213	1-126-963-11	ELECT	4.7µF	20%	50V	C424	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V
C220	1-125-891-11	CERAMIC CHIP	0.47µF	10%	10V	C430	1-126-963-11	ELECT	4.7µF	20%	50V
C301	1-126-956-91	ELECT	0.1µF	20%	50V	C431	1-126-963-11	ELECT	4.7µF	20%	50V
C302	1-126-956-91	ELECT	0.1µF	20%	50V	C436	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C303	1-126-956-91	ELECT	0.1µF	20%	50V	C450	1-126-943-11	ELECT	2200µF	20%	25V
C304	1-126-956-91	ELECT	0.1µF	20%	50V	C451	1-126-959-11	ELECT	0.47µF	20%	50V
C305	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V	C452	1-126-960-11	ELECT	1µF	20%	50V
C306	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V	C457	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C307	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V	(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C313	1-126-956-91	ELECT	0.1µF	20%	50V	C457	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
(KV-27FA310/29FA310 ONLY)											
C317	1-126-964-11	ELECT	10µF	20%	50V	C458	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C318	1-126-964-11	ELECT	10µF	20%	50V	(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C319	1-126-964-11	ELECT	10µF	20%	50V	C458	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C325	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V	(KV-27FA310/29FA310 ONLY)					
C326	1-164-505-11	CERAMIC CHIP	2.2µF		16V	C460	1-126-943-11	ELECT	2200µF	20%	25V
C328	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V	C461	1-126-943-11	ELECT	2200µF	20%	25V
C330	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V	C462	1-126-943-11	ELECT	2200µF	20%	25V
C337	1-162-919-11	CERAMIC CHIP	22pF	5%	50V	C463	1-126-943-11	ELECT	2200µF	20%	25V
C351	1-164-315-11	CERAMIC CHIP	470pF	5%	50V	C470	1-126-935-11	ELECT	470µF	20%	16V
C370	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V	C501	1-126-959-11	ELECT	0.47µF	20%	50V
C390	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V	C502	1-102-112-00	CERAMIC	330pF	10%	50V
C400	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V	C503	1-106-383-00	MYLAR	0.047µF	10%	200V
C401	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V	C504	1-102-228-00	CERAMIC	470pF	10%	500V
C402	1-164-174-11	CERAMIC CHIP	0.0082µF	10%	25V	C505	1-102-228-00	CERAMIC	470pF	10%	500V
C403	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V	⚠ C506	1-117-214-11	CERAMIC	0.001µF	10%	2KV
C404	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V	⚠ C507	1-127-717-21	FILM	19000pF	3%	1.2KV
C405	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V	⚠ C508	1-129-722-00	FILM	0.047µF	5%	630V
C406	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V	C509	1-126-964-11	ELECT	10µF	20%	50V
C407	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V	⚠ C510	1-162-116-00	CERAMIC	680pF	10%	2KV
C408	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V	C511	1-109-844-11	FILM	0.68µF	5%	400V
C409	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V	C512	1-104-987-11	MYLAR	0.001µF	5%	200V
C410	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V	⚠ C513	1-106-383-00	MYLAR	0.047µF	10%	200V
C411	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V	C514	1-115-521-11	FILM	0.82µF	5%	250V
C412	1-126-960-11	ELECT	1µF	20%	50V	C515	1-107-649-11	ELECT	2.2µF	20%	250V
C413	1-126-963-11	ELECT	4.7µF	20%	50V	C516	1-117-412-11	FILM	0.24µF	5%	250V
C414	1-126-961-11	ELECT	2.2µF	20%	50V	C519	1-216-864-11	SHORT CHIP			
C415	1-126-963-11	ELECT	4.7µF	20%	50V	C520	1-126-965-91	ELECT	22µF	20%	50V
C416	1-126-960-11	ELECT	1µF	20%	50V	C521	1-126-960-11	ELECT	1µF	20%	50V
C418	1-126-963-11	ELECT	4.7µF	20%	50V						

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**A**

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES					
C522	1-102-244-00	CERAMIC	220pF	10%	500V	 C602	1-165-529-11	MYLAR	0.22μF	10	275V			
C523	1-165-529-11	MYLAR	0.22μF	10	275V	 C603	1-165-529-11	MYLAR	0.22μF	10	275V			
C525	1-164-646-11	CERAMIC	2200pF	10%	500V	 C605	1-117-699-11	CERAMIC	0.001μF	20%	250V			
C526	1-102-244-00	CERAMIC	220pF	10%	500V	C609	1-126-942-61	ELECT	1000pF	20%	25V			
C527	1-107-645-11	ELECT	22μF	20%	200V	C610	1-164-645-11	CERAMIC	1000pF	10%	500V			
			(KV-27FS120/29FS120LN/29FS120LS ONLY)											
C529	1-164-690-91	CERAMIC CHIP	0.0022μF	5%	50V	C611	1-126-971-11	ELECT	470μF	20%	50V			
C534	1-162-966-11	CERAMIC CHIP	0.0022μF	10%	50V	C612	1-126-961-11	ELECT	2.2μF	20%	50V			
C536	1-162-968-11	CERAMIC CHIP	0.0047μF	10%	50V	C613	1-161-964-91	CERAMIC	0.0047μF	250V				
C537	1-162-964-11	CERAMIC CHIP	0.001μF	10%	50V	C615	1-161-964-91	CERAMIC	0.0047μF	250V				
C539	1-162-970-11	CERAMIC CHIP	0.01μF	10%	25V	C616	1-126-943-11	ELECT	2200μF	20%	25V			
C542	1-162-966-11	CERAMIC CHIP	0.0022μF	10%	50V	(KV-27FS120/29FS120LN/29FS120LS ONLY)								
C543	1-102-106-00	CERAMIC CHIP	.0001μF		50V	C617	1-107-935-11	ELECT	330μF	20%	100V			
	(KV-27FA310/29FA310 ONLY)			(KV-27FS120/29FS120LN/29FS120LS ONLY)			C618	1-107-935-11	ELECT	330μF	20%	100V		
C544	1-126-967-11	ELECT	47μF	20%	50V	(KV-27FS120/29FS120LN/29FS120LS ONLY)								
C545	1-126-969-11	ELECT	220μF	20%	50V	C620	1-162-970-11	CERAMIC CHIP	0.01μF	10%	25V			
				(KV-27FS120/29FS120LN/29FS120LS ONLY)			C621	1-117-893-11	ELECT	470μF	20%	250V		
C546	1-137-194-81	FILM	0.47μF	5%	50V	(KV-27FS120/29FS120LN/29FS120LS ONLY)			C621	1-117-894-11	ELECT	560μF	20%	250V
C549	1-101-821-00	CERAMIC	0.0022μF		500V				(KV-27FA310/29FA310 ONLY)					
C550	1-104-666-11	ELECT	220μF	20%	25V	C624	1-107-636-11	ELECT	10μF	20%	160V			
C551	1-126-960-11	ELECT	1μF	20%	50V				C625	1-126-964-11	ELECT	10μF	20%	50V
C552	1-126-964-11	ELECT	10μF	20%	50V	(KV-27FS120/29FS120LN/29FS120LS ONLY)								
C553	1-107-826-11	CERAMIC CHIP	0.1μF	10%	16V	C629	1-117-893-11	ELECT	470μF	20%	250V			
C554	1-162-970-11	CERAMIC CHIP	0.01μF	10%	25V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C555	1-101-821-00	CERAMIC	0.0022μF		500V	C629	1-117-894-11	ELECT	560μF	20%	250V			
C558	1-162-318-11	CERAMIC	0.001μF	10%	500V				(KV-27FA310/29FA310 ONLY)					
C559	1-216-864-11	SHORT CHIP				C631	1-113-896-11	CERAMIC	220pF	10%	250V			
				(KV-27FS120/29FS120LN/29FS120LS ONLY)										
C560	1-216-833-11	METAL CHIP	10K	5%	1/10W	C632	1-126-967-11	ELECT	47μF	20%	50V			
C561	1-126-963-11	ELECT	4.7μF	20%	50V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C562	1-104-666-11	ELECT	220μF	20%	25V	C633	1-136-479-11	FILM	0.001μF	5%	100V			
C563	1-162-970-11	CERAMIC CHIP	0.01μF	10%	25V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C566	1-107-635-11	ELECT	4.7μF	20%	160V	C634	1-126-947-11	ELECT	47μF	20%	35V			
C571	1-104-665-11	ELECT	100μF	20%	25V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C581	1-136-161-00	FILM	0.047μF	5%	50V	C635	1-126-963-11	ELECT	4.7μF	20%	50V			
C582	1-106-387-00	MYLAR	0.068μF	10%	200V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C585	1-104-666-11	ELECT	220μF	20%	25V	C636	1-127-715-91	CERAMIC CHIP	0.22μF	10%	16V			
C588	1-137-417-11	MYLAR	0.015μF	10%	100V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C589	1-128-560-11	ELECT	22μF	20%	100V	C637	1-127-715-91	CERAMIC CHIP	0.22μF	10%	16V			
C590	1-126-964-11	ELECT	10μF	20%	50V				(KV-27FS120/29FS120LN/29FS120LS ONLY)					
C594	1-123-024-21	ELECT	33μF		160V	C638	1-104-665-11	ELECT	100μF	20%	25V			
C595	1-104-666-11	ELECT	220μF	20%	25V									
C597	1-104-666-11	ELECT	220μF	20%	25V									
C600	1-126-964-11	ELECT	10μF	20%	50V									
C601	1-117-703-11	CERAMIC	0.0047μF		250V									
	(KV-29FS120LS/29FA310LS ONLY)													

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**A**

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES			
C640	1-164-645-11	CERAMIC (KV-27FS120/29FS120LN/29FS120LS ONLY)	1000pF	10%	500V	*	CN515	1-580-798-11	CONNECTOR PIN (DY)	6P		
C642	1-126-969-11	ELECT (KV-27FS120/29FS120LN/29FS120LS ONLY)	220µF	20%	50V	*	CN585	1-564-511-11	PLUG, CONNECTOR	8P		
C643	1-130-777-00	MYLAR (KV-27FS120/29FS120LN/29FS120LS ONLY)	0.1µF	5%	100V	*  CN600	1-580-843-11	PIN, CONNECTOR (POWER)				
C645	1-162-964-11	CERAMIC CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	0.001µF	10%	50V	*	CN601	1-580-843-11	PIN, CONNECTOR (POWER) (KV-27FA310/29FA310 ONLY)			
C647	1-126-947-11	ELECT (KV-27FS120/29FS120LN/29FS120LS ONLY)	47µF	20%	35V	*	CN602	1-564-509-11	PLUG, CONNECTOR (KV-27FA310/29FA310 ONLY)	6P		
<b>DIODE</b>												
C648	1-104-330-91	CERAMIC (KV-27FS120/29FS120LN/29FS120LS ONLY)	470pF	10%	1KV	D002	8-719-109-89	DIODE	RD5.6ESB2			
C650	1-126-942-61	ELECT (KV-27FS120/29FS120LN/29FS120LS ONLY)	1000µF	20%	25V	D003	8-719-110-17	DIODE	RD10ESB2			
C651	1-126-942-61	ELECT (KV-27FS120/29FS120LN/29FS120LS ONLY)	1000µF	20%	25V	D004	8-719-110-17	DIODE	RD10ESB2			
C652	1-164-227-11	CERAMIC CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	0.022µF	10%	25V	D005	8-719-110-17	DIODE	RD10ESB2			
C655	1-104-330-91	CERAMIC (KV-27FS120/29FS120LN/29FS120LS ONLY)	470pF	10%	1KV	D006	8-719-921-44	DIODE	MTZJ-5.1C			
C660	1-126-947-11	ELECT	47µF	20%	35V	D007	8-719-982-22	DIODE	MTZJ-30D			
C661	1-104-665-11	ELECT	100µF	20%	25V	D046	8-719-109-89	DIODE	RD5.6ESB2			
C665	1-104-665-11	ELECT	100µF	20%	25V	D047	8-719-109-89	DIODE	RD5.6ESB2			
C672	1-137-756-22	FILM (KV-27FS120/29FS120LN/29FS120LS ONLY)	22000pF	3%	800V	D050	8-719-510-02	DIODE	D1NS4			
C673	1-126-963-11	ELECT	4.7µF	20%	50V	D051	6-500-175-01	DIODE	1E3-TB			
 C680	1-117-699-11	CERAMIC	0.001µF	20%	250V	D052	8-719-109-89	DIODE	RD5.6ESB2			
	C690	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V	D200	8-719-929-15	DIODE	HZS9.1NB2		
	C901	1-218-712-11	METAL CHIP	6.8K	0.50%	1/10W	D201	8-719-929-15	DIODE	HZS9.1NB2		
<b>CONNECTOR</b>												
* CN002	1-564-510-11	PLUG, CONNECTOR (KV-27FS120/29FS120LN/29FS120LS ONLY)		7P		D202	8-719-929-15	DIODE	HZS9.1NB2			
* CN002	1-564-509-11	PLUG, CONNECTOR (KV-27FA310/29FA310 ONLY)		6P		D203	8-719-929-15	DIODE	PDZ9.1B-115			
* CN003	1-560-124-00	PLUG, CONNECTOR (2.5MM)		4P		D204	8-719-929-15	DIODE	MA111-TX			
* CN004	1-564-510-11	PLUG, CONNECTOR		7P		D205	8-719-929-15	DIODE	HZS9.1NB2			
* CN401	1-564-507-11	PLUG, CONNECTOR		4P		D206	8-719-070-62	DIODE	MA111-TX			
* CN404	1-564-507-11	PLUG, CONNECTOR (KV-27FA310/29FA310 ONLY)		4P		D207	8-719-404-50	DIODE	RD10ESB2			
* CN501	1-573-963-11	PIN, CONNECTOR (PC BOARD)		3P		D208	8-719-929-15	DIODE	HZS9.1NB2			
* CN506	1-564-507-11	PLUG, CONNECTOR (KV-27FS120/29FS120LN/29FS120LS ONLY)		4P		D209	8-719-404-50	DIODE	MA111-TX			
						D230	8-719-108-12	DIODE	RD9.1EW			
						D231	8-719-108-12	DIODE	RD9.1EW			
						D232	8-719-108-12	DIODE	RD9.1EW			
						D234	8-719-108-12	DIODE	RD9.1EW			
						D235	8-719-108-12	DIODE	RD9.1EW			
						D236	8-719-108-12	DIODE	RD9.1EW			
						D237	8-719-108-12	DIODE	RD9.1EW			
						D317	8-719-108-12	DIODE	RD9.1EW			
						D321	8-719-110-17	DIODE	RD10ESB2			
						D351	8-719-109-66	DIODE	RD3.3ESB2			
						D390	8-719-404-50	DIODE	MA111-TX			
						D401	8-719-921-63	DIODE	MTZJ-7.5B			
						D405	8-719-991-33	DIODE	1SS13T-77			

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**A**

REF. NO.	PART NO.	DESCRIPTION	VALUES	REF. NO.	PART NO.	DESCRIPTION	VALUES
D412	1-216-864-11	SHORT CHIP		D614	8-719-057-52	DIODE	EZ0150AV1
D414	8-719-921-63	DIODE	MTZJ-7.5B				(KV-27FS120/29FS120LN/29FS120LS ONLY)
D430	8-719-929-15	DIODE	HZS9.1NB2	D615	6-500-177-01	DIODE	MA7D50
D431	8-719-929-15	DIODE	HZS9.1NB2				(KV-27FS120/29FS120LN/29FS120LS ONLY)
D500	8-719-404-50	DIODE	MA111-TX	D618	8-719-979-64	DIODE	UF4005PKG23
							(KV-27FS120/29FS120LN/29FS120LS ONLY)
D501	8-719-404-50	DIODE	MA111-TX	D620	8-719-911-19	DIODE	1SS119-25
D505	8-719-081-00	DIODE	BY228/A52A/	D621	8-719-510-37	DIODE	D5LC20U
D506	8-719-312-10	DIODE	RU4AM-T3				(KV-27FS120/29FS120LN/29FS120LS ONLY)
D507	8-719-991-33	DIODE	1SS133T-77	D624	8-719-510-73	DIODE	S3L20UF4
D508	8-719-404-50	DIODE	MA111-TX				(KV-27FS120/29FS120LN/29FS120LS ONLY)
D510	8-719-081-00	DIODE	BY228/A52A/	D628	8-719-404-50	DIODE	MA111-TX
D513	8-719-404-50	DIODE	MA111-TX	D629	8-719-110-31	DIODE	RD12ESB2
D514	8-719-908-03	DIODE	GP08D	D631	6-500-175-01	DIODE	1E3-TB
D515	8-719-908-03	DIODE	GP08D				(KV-27FS120/29FS120LN/29FS120LS ONLY)
D525	8-719-991-33	DIODE	1SS133T-77	D641	8-719-991-33	DIODE	1SS133T-77
D526	8-719-074-25	DIODE	PG104R	D642	8-719-982-22	DIODE	MTZJ-30D
D528	8-719-991-33	DIODE	1SS133T-77	D644	8-719-110-31	DIODE	RD12ESB2
D545	8-719-908-03	DIODE	GP08D	D645	8-719-109-89	DIODE	RD5.6ESB2
D558	8-719-404-50	DIODE	MA111-TX	D650	8-719-109-89	DIODE	RD5.6ESB2
D559	8-719-404-50	DIODE	MA111-TX				
D562	8-719-991-33	DIODE	1SS133T-77				
 D566	8-719-979-84	DIODE	EGP20DPKG23				
 D567	8-719-991-33	DIODE	1SS133T-77				
 D568	8-719-921-63	DIODE	MTZJ-7.5B				
D569	8-719-921-44	DIODE	MTZJ-5.1C				
D587	8-719-074-25	DIODE	PG104R				
D589	8-719-991-33	DIODE	1SS133T-77				
D596	8-719-979-85	DIODE	EGP20G				
D598	8-719-979-85	DIODE	EGP20G				
D603	8-719-064-12	DIODE	S1NB60-4062				
D604	6-500-890-01	DIODE	1N5406G-EB	FB301	1-410-397-21	FERRITE	1.1 $\mu$ H
			(KV-27FS120/29FA310LN/29FS120LN ONLY)	FB505	1-410-397-21	FERRITE	1.1 $\mu$ H
D605	8-719-510-53	DIODE	D4SB60L	FB506	1-410-397-21	FERRITE	1.1 $\mu$ H
			(KV-29FS120LS/29FA310LS ONLY)	FB522	1-410-397-21	FERRITE	1.1 $\mu$ H
D606	6-500-890-01	DIODE	1N5406G-EB	FB601	1-410-397-21	FERRITE	1.1 $\mu$ H
			(KV-27FS120/29FA310LN/29FS120LN ONLY)				
D611	8-719-510-73	DIODE	S3L20UF4	FB602	1-410-397-21	FERRITE	1.1 $\mu$ H
			(KV-27FS120/29FS120LS/29FS120LN ONLY)	FB603	1-410-397-21	FERRITE	1.1 $\mu$ H
D612	8-719-068-00	DIODE	ERC04-06SE				(KV-27FS120/29FS120LN/29FS120LS ONLY)
			(KV-27FS120/29FA310LN/29FS120LN ONLY)	FB604	1-410-397-21	FERRITE	1.1 $\mu$ H
D613	8-719-068-00	DIODE	ERC04-06SE				(KV-27FS120/29FA310LN/29FS120LN ONLY)
			(KV-27FS120/29FS120LN/29FS120LN ONLY)	FB605	1-410-397-21	FERRITE	1.1 $\mu$ H
				FB616	1-469-578-11	FERRITE	1.1 $\mu$ H
							(KV-27FS120/29FS120LN/29FS120LS ONLY)



REF. NO.	PART NO.	DESCRIPTION	VALUES	REF. NO.	PART NO.	DESCRIPTION	VALUES
FB617	1-469-578-11	FERRITE	1.1μH			<u>CHIP CONDUCTOR</u>	
		(KV-27FS120/29FS120LN/29FS120LS ONLY)		JR2	1-216-864-11	SHORT CHIP	
		<u><b>FILTER</b></u>		JR6	1-216-864-11	SHORT CHIP	
FL001	1-239-803-11	ENCAPSULATED COMPONENT		JR7	1-216-864-11	SHORT CHIP	
				JR12	1-216-864-11	SHORT CHIP	
		<u><b>IC</b></u>		JR44	1-216-864-11	SHORT CHIP	
IC001	6-804-178-01	IC	M65582AUF-XXXFP	JR102	1-216-864-11	SHORT CHIP	
IC002	6-704-004-01	IC	BR24L16F-WE2	JR128	1-216-864-11	SHORT CHIP	
IC003	8-759-352-91	IC	PST9143NL	JR201	1-216-864-11	SHORT CHIP	
IC321	8-759-353-00	IC	NJM2534M(TE2)	JR207	1-216-864-11	SHORT CHIP	
IC400	6-703-190-01	IC	NJW1134AGK1-TE2	JR209	1-216-864-11	SHORT CHIP	
		(KV-27FS120/29FS120LN/29FS120LS ONLY)		JR211	1-216-864-11	SHORT CHIP	
IC400	6-706-033-01	IC	W1172JK1-TE	JR212	1-216-864-11	SHORT CHIP	
		(KV-27FA310/29FA310 ONLY)		JR213	1-216-864-11	SHORT CHIP	
IC404	6-705-054-01	IC	TDA8947J	JR214	1-216-864-11	SHORT CHIP	
IC545	8-759-696-71	IC	STV9379A	JR215	1-216-864-11	SHORT CHIP	
IC561	8-759-700-07	IC	NJM2903M	JR216	1-216-864-11	SHORT CHIP	
				JR217	1-216-864-11	(KV-27FS120/29FS120LN/29FS120LS ONLY)	
IC565	8-759-700-44	IC	NJM2902M	JR255	1-216-864-11	SHORT CHIP	
IC600	6-705-810-01	IC	MCZ3001DB	JR301	1-216-864-11	SHORT CHIP	
		(KV-27FS120/29FS120LN/29FS120LS ONLY)		JR302	1-216-864-11	SHORT CHIP	
IC603	6-705-818-01	IC	MC7809CF	JR303	1-216-864-11	SHORT CHIP	
		(KV-27FS120/29FS120LN/29FS120LS ONLY)		JR304	1-216-864-11	SHORT CHIP	
IC603	6-705-466-01	IC	BA90BC0T	JR305	1-216-864-11	SHORT CHIP	
		(KV-27FA310/29FA310 ONLY)		JR306	1-216-864-11	SHORT CHIP	
IC604	8-749-012-13	IC	DM-58	JR310	1-216-864-11	SHORT CHIP	
		(KV-27FS120/29FS120LN/29FS120LS ONLY)		JR311	1-216-864-11	SHORT CHIP	
IC608	8-759-450-47	IC	BA05T	JR312	1-216-864-11	SHORT CHIP	
IC633	6-703-080-01	IC	LF33CV	JR315	1-216-864-11	SHORT CHIP	
				JR317	1-216-864-11	SHORT CHIP	
				JR401	1-216-864-11	SHORT CHIP	
				JR411	1-216-864-11	SHORT CHIP	
		<u><b>JACK</b></u>		JR485	1-216-864-11	SHORT CHIP	
J200	1-794-119-11	TERMINAL BLOCK, S	4P	JR486	1-216-864-11	SHORT CHIP	
J202	1-794-118-11	JACK BLOCK, PIN	3P	JR504	1-216-864-11	SHORT CHIP	
*	J203	1-817-461-11	PIN JACK BLOCK	JR585	1-216-864-11	SHORT CHIP	
J205	1-794-116-11	JACK BLOCK, PIN	2P	JR586	1-216-864-11	SHORT CHIP	
		(KV-27FS120/29FS120LN/29FS120LS ONLY)		JR1502	1-216-864-11	SHORT CHIP	
J205	1-818-352-11	PIN JACK W/ DIN CONNECTOR				<u><b>JUMPER WIRE</b></u>	
		(KV-27FA310/29FA310 ONLY)		JW57	1-249-409-11	CARBON	
							220
							5%
							1/4W

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**A**

REF. NO.	PART NO.	DESCRIPTION	VALUES	REF. NO.	PART NO.	DESCRIPTION	VALUES	
<b><u>COIL</u></b>								
L002	1-239-803-11	ENCAPSULATED COMPONENT		Q009	8-729-422-27	TRANSISTOR	2SD601A-Q	
L003	1-239-803-11	ENCAPSULATED COMPONENT		Q300	8-729-422-27	TRANSISTOR	2SD601A-Q	
L004	1-239-803-11	ENCAPSULATED COMPONENT		Q301	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	
L005	1-239-803-11	ENCAPSULATED COMPONENT		Q303	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	
L006	1-414-273-11	INDUCTOR	100 $\mu$ H	Q304	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	
L007	1-414-273-11	INDUCTOR	100 $\mu$ H	Q305	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	
L008	1-414-857-11	INDUCTOR	100 $\mu$ H	Q306	8-729-424-02	TRANSISTOR	2SD601A-Q	
L009	1-414-857-11	INDUCTOR	100 $\mu$ H	Q316	8-729-422-27	TRANSISTOR	2SD601A-Q	
L010	1-414-267-21	INDUCTOR	10 $\mu$ H	Q390	8-729-422-27	TRANSISTOR	2SD601A-Q	
L011	1-239-803-11	ENCAPSULATED COMPONENT		Q391	8-729-422-27	TRANSISTOR	2SD601A-Q	
L101	1-414-229-11	FERRITE	0 $\mu$ H	Q400	8-729-422-27	TRANSISTOR	2SD601A-Q	
L513	1-406-677-11	INDUCTOR	10MH	Q401	8-729-422-27	TRANSISTOR	2SD601A-Q	
L515	1-412-552-11	INDUCTOR	2.2MH	Q404	8-729-422-27	TRANSISTOR	2SD601A-Q	
L516	1-419-714-11	INDUCTOR	100 $\mu$ H	Q411	8-729-422-27	TRANSISTOR	2SD601A-Q	
L525	1-409-955-31	INDUCTOR	8MH	Q412	8-729-422-27	TRANSISTOR	2SD601A-Q	
L527	1-410-397-21	FERRITE	1.1 $\mu$ H	Q501	8-729-423-33	TRANSISTOR	2SC311A-QRSTA	
 L588	1-412-523-41	INDUCTOR	6.8 $\mu$ H	Q502	8-729-140-50	TRANSISTOR	2SC3209LK	
	L606	1-412-525-31	INDUCTOR	10 $\mu$ H	Q503	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
(KV-27FS120/29FS120LN/29FS120LS ONLY)				Q504	8-729-422-27	TRANSISTOR	2SD601A-Q	
L607	1-412-525-31	INDUCTOR	10 $\mu$ H	Q505	6-550-107-01	TRANSISTOR	2SD2645-YB	
	(KV-27FS120/29FS120LN/29FS120LS ONLY)				Q521	8-729-423-33	TRANSISTOR	2SC311A-QRSTA
L608	1-412-533-21	INDUCTOR	47 $\mu$ H	Q522	8-729-053-87	TRANSISTOR	KTC4370A	
	(KV-27FS120/29FS120LN/29FS120LS ONLY)				Q531	8-729-422-27	TRANSISTOR	2SD601A-Q
L608	1-410-397-21	INDUCTOR	1.1 $\mu$ H	Q533	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	
	(KV-27FA310/29FA310 ONLY)				Q572	8-729-422-27	TRANSISTOR	2SD601A-Q
L609	1-412-525-31	INDUCTOR	10 $\mu$ H	Q573	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	
	(KV-27FS120/29FS120LN/29FS120LS ONLY)				Q578	8-729-422-27	TRANSISTOR	2SD601A-Q
<b><u>PHOTO COUPLER</u></b>				Q590	6-550-362-01	TRANSISTOR	KTA1279	
 PH602	8-749-010-64	PHOTO COUPLER	PC123F2	Q600	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122	
	(KV-27FS120/29FS120LN/29FS120LS ONLY)				(KV-27FS120/29FS120LN/29FS120LS ONLY)			
<b><u>IC LINK</u></b>								
PS401	1-576-337-21	IC LINK	2.7A	50V	Q604	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
<b><u>RESISTOR</u></b>								
<b><u>TRANSISTOR</u></b>								
Q002	8-729-422-27	TRANSISTOR	2SD601A-Q	R002	1-216-864-11	SHORT CHIP		
Q004	8-729-422-27	TRANSISTOR	2SD601A-Q	R003	1-216-821-11	METAL CHIP	1K 5% 1/10W	
Q005	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	R004	1-216-817-11	METAL CHIP	470 5% 1/10W	
Q006	8-729-422-27	TRANSISTOR	2SD601A-Q	R005	1-400-427-21	FERRITE	0 $\mu$ H	
Q008	8-729-422-27	TRANSISTOR	2SD601A-Q	R006	1-216-829-11	METAL CHIP	4.7K 5% 1/10W	



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R007	1-400-427-21	FERRITE	0 $\mu$ H			R085	1-216-864-11	SHORT CHIP			
R015	1-216-833-11	METAL CHIP	10K	5%	1/10W	R086	1-216-821-11	METAL CHIP	1K	5%	1/10W
R027	1-218-732-11	METAL CHIP	47K	0.50%	1/10W	R087	1-247-807-31	CARBON	100	5%	1/4W
R028	1-249-409-11	CARBON	220	5%	1/4W	R088	1-216-864-11	SHORT CHIP			
R029	1-249-409-11	CARBON	220	5%	1/4W	R090	1-216-837-11	METAL CHIP	22K	5%	1/10W
R030	1-249-409-11	CARBON	220	5%	1/4W	R091	1-216-841-11	METAL CHIP	47K	5%	1/10W
R031	1-216-813-11	METAL CHIP	220	5%	1/10W	R092	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R032	1-216-813-11	METAL CHIP	220	5%	1/10W	R093	1-216-841-11	METAL CHIP	47K	5%	1/10W
R033	1-249-409-11	CARBON	220	5%	1/4W	R094	1-414-229-11	FERRITE	0 $\mu$ H		
R035	1-216-809-11	METAL CHIP	100	5%	1/10W	R095	1-216-813-11	METAL CHIP	220	5%	1/10W
R037	1-216-833-11	METAL CHIP	10K	5%	1/10W	R096	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R038	1-216-821-11	METAL CHIP	1K	5%	1/10W	R098	1-216-839-11	METAL CHIP	33K	5%	1/10W
R039	1-216-815-11	METAL CHIP	330	5%	1/10W	R101	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R040	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R102	1-216-837-11	METAL CHIP	22K	5%	1/10W
R041	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R103	1-216-833-11	METAL CHIP	10K	5%	1/10W
R042	1-216-813-11	METAL CHIP	220	5%	1/10W	R105	1-216-864-11	SHORT CHIP			
R043	1-216-813-11	METAL CHIP	220	5%	1/10W	R107	1-414-229-11	FERRITE	0 $\mu$ H		
R044	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R108	1-414-229-11	FERRITE	0 $\mu$ H		
R045	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R109	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R047	1-249-409-11	CARBON	220	5%	1/4W	R110	1-249-409-11	CARBON	220	5%	1/4W
R048	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R111	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R049	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R112	1-249-425-11	CARBON	4.7K	5%	1/4W
R050	1-249-425-11	CARBON	4.7K	5%	1/4W	R115	1-216-817-11	METAL CHIP	470	5%	1/10W
R051	1-249-417-11	CARBON	1K	5%	1/4W	R116	1-216-853-11	METAL CHIP	470K	5%	1/10W
R052	1-216-813-11	METAL CHIP	220	5%	1/10W	R200	1-216-813-11	METAL CHIP	220	5%	1/10W
R053	1-249-433-11	CARBON	22K	5%	1/4W	R202	1-216-845-11	METAL CHIP	100K	5%	1/10W
R054	1-249-433-11	CARBON	22K	5%	1/4W	R203	1-216-845-11	METAL CHIP	100K	5%	1/10W
R055	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R210	1-216-845-11	METAL CHIP	100K	5%	1/10W
R056	1-216-833-11	METAL CHIP	10K	5%	1/10W	R211	1-249-409-11	CARBON	220	5%	1/4W
R057	1-249-417-11	CARBON	1K	5%	1/4W	R212	1-249-409-11	CARBON	220	5%	1/4W
R058	1-249-429-11	CARBON	10K	5%	1/4W	R213	1-216-845-11	METAL CHIP	100K	5%	1/10W
R059	1-249-417-11	CARBON	1K	5%	1/4W	R215	1-216-853-11	METAL CHIP	470K	5%	1/10W
R060	1-249-409-11	CARBON	220	5%	1/4W	R216	1-216-853-11	METAL CHIP	470K	5%	1/10W
R061	1-249-429-11	CARBON	10K	5%	1/4W	R217	1-249-409-11	CARBON	220	5%	1/4W
R062	1-249-413-11	CARBON	470	5%	1/4W	R218	1-216-813-11	METAL CHIP	220	5%	1/10W
R063	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R220	1-216-813-11	METAL CHIP	220	5%	1/10W
R070	1-249-409-11	CARBON	220	5%	1/4W	R221	1-249-409-11	CARBON	220	5%	1/4W
R072	1-249-425-11	CARBON	4.7K	5%	1/4W	R222	1-249-409-11	CARBON	220	5%	1/4W
R076	1-247-807-31	CARBON	100	5%	1/4W	R227	1-218-285-11	METAL CHIP	75	5%	1/10W
R080	1-216-833-11	METAL CHIP	10K	5%	1/10W	R229	1-218-285-11	METAL CHIP	75	5%	1/10W
R081	1-216-841-11	METAL CHIP	47K	5%	1/10W	R230	1-218-285-11	METAL CHIP	75	5%	1/10W
R082	1-216-857-11	METAL CHIP	1M	5%	1/10W	R250	1-216-821-11	METAL CHIP	1K	5%	1/10W
R083	1-216-847-11	METAL CHIP	150K	5%	1/10W	R251	1-216-821-11	METAL CHIP	1K	5%	1/10W
R084	1-216-819-11	METAL CHIP	680	5%	1/10W	R303	1-216-863-11	METAL CHIP	3.3M	5%	1/10W



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R305	1-218-285-11	METAL CHIP	75	5%	1/10W	R405	1-216-833-11	METAL CHIP	10K	5%	1/10W
R308	1-216-821-11	METAL CHIP	1K	5%	1/10W	R406	1-216-813-11	METAL CHIP	220	5%	1/10W
R309	1-216-833-11	METAL CHIP	10K	5%	1/10W	R407	1-216-813-11	METAL CHIP	220	5%	1/10W
R310	1-216-821-11	METAL CHIP	1K	5%	1/10W	R408	1-216-864-11	SHORT CHIP			
R311	1-216-813-11	METAL CHIP	220	5%	1/10W	R409	1-216-864-11	SHORT CHIP			
R312	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W	R410	1-216-833-11	METAL CHIP	10K	5%	1/10W
R313	1-216-864-11	SHORT CHIP				R411	1-216-833-11	METAL CHIP	10K	5%	1/10W
R314	1-216-833-11	METAL CHIP	10K	5%	1/10W	R415	1-216-809-11	METAL CHIP	100	5%	1/10W
R315	1-216-813-11	METAL CHIP	220	5%	1/10W			(KV-27FA310/29FA310 ONLY)			
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R418	1-216-809-11	METAL CHIP	100	5%	1/10W
								(KV-27FA310/29FA310 ONLY)			
R317	1-216-813-11	METAL CHIP	220	5%	1/10W	R419	1-216-864-11	SHORT CHIP			
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W			(KV-27FS120/29FS120LN/29FS120LS ONLY)			
R319	1-216-813-11	METAL CHIP	220	5%	1/10W	R420	1-216-864-11	SHORT CHIP			
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W			(KV-27FS120/29FS120LN/29FS120LS ONLY)			
R321	1-247-807-31	CARBON	100	5%	1/4W	R421	1-216-864-11	SHORT CHIP			
R322	1-218-684-11	METAL CHIP	470	0.50%	1/10W						
R323	1-215-415-00	METAL	560	1%	1/4W	R422	1-216-833-11	METAL CHIP	10K	5%	1/10W
R324	1-216-821-11	METAL CHIP	1K	5%	1/10W	R427	1-216-841-11	METAL CHIP	47K	5%	1/10W
R325	1-216-864-11	SHORT CHIP				R429	1-216-841-11	METAL CHIP	47K	5%	1/10W
R326	1-400-427-21	FERRITE	0µH			R430	1-216-845-11	METAL CHIP	100K	5%	1/10W
						R431	1-216-845-11	METAL CHIP	100K	5%	1/10W
R328	1-400-427-21	FERRITE	0µH								
R330	1-218-285-11	METAL CHIP	75	5%	1/10W	R433	1-216-809-11	METAL CHIP	100	5%	1/10W
R335	1-216-813-11	METAL CHIP	220	5%	1/10W	R434	1-216-864-11	SHORT CHIP			
R337	1-216-801-11	METAL CHIP	22	5%	1/10W	R442	1-216-809-11	METAL CHIP	100	5%	1/10W
R338	1-216-864-11	SHORT CHIP				R450	1-249-425-11	CARBON	4.7K	5%	1/4W
						R477	1-216-819-11	METAL CHIP	680	5%	1/10W
R339	1-216-813-11	METAL CHIP	220	5%	1/10W	R478	1-216-833-11	METAL CHIP	10K	5%	1/10W
R351	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R479	1-216-821-11	METAL CHIP	1K	5%	1/10W
R352	1-216-853-11	METAL CHIP	470K	5%	1/10W	R499	1-216-845-11	METAL CHIP	100K	5%	1/10W
R363	1-218-285-11	METAL CHIP	75	5%	1/10W	R501	1-249-411-11	CARBON	330	5%	1/4W
R364	1-218-285-11	METAL CHIP	75	5%	1/10W	R502	1-249-425-11	CARBON	4.7K	5%	1/4W
R370	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R503	1-215-919-11	METAL OXIDE	2.2K	5%	3W
R371	1-216-849-11	METAL CHIP	220K	5%	1/10W	R504	1-249-425-11	CARBON	4.7K	5%	1/4W
R372	1-216-827-11	METAL CHIP	3.3K	5%	1/10W	R507	1-216-833-11	METAL CHIP	10K	5%	1/10W
R382	1-216-863-11	METAL CHIP	3.3M	5%	1/10W	R510	1-260-328-11	CARBON	1K	5%	1/2W
R390	1-216-864-11	SHORT CHIP				R513	1-215-908-00	METAL OXIDE	33	5%	3W
R391	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R514	1-215-910-00	METAL OXIDE	68	5%	3W
R392	1-216-818-11	METAL CHIP	560	5%	1/10W	R515	1-215-882-00	METAL OXIDE	22	5%	2W
R393	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R517	1-216-839-11	METAL CHIP	33K	5%	1/10W
R394	1-216-833-11	METAL CHIP	10K	5%	1/10W	R520	1-216-833-11	METAL CHIP	10K	5%	1/10W
R400	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R521	1-216-819-11	METAL CHIP	680	5%	1/10W
R401	1-216-809-11	METAL CHIP	100	5%	1/10W	R522	1-249-411-11	CARBON	330	5%	1/4W
R402	1-216-864-11	SHORT CHIP				R524	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
R403	1-216-809-11	METAL CHIP	100	5%	1/10W	R525	1-215-884-11	METAL OXIDE	47	5%	2W
R404	1-216-825-11	METAL CHIP	2.2K	5%	1/10W						

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

A component identified by this  symbol indicates that it has been carefully factory-selected to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

A

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R526	1-218-724-11	METAL CHIP	22K	0.50%	1/10W	R583	1-249-377-11	CARBON	0.47	5%	1/4W
R527	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R584	1-215-451-00	METAL	18K	1%	1/4W
R528	1-216-816-11	METAL CHIP	390	5%	1/10W	R585	1-215-447-00	METAL	12K	1%	1/4W
R529	1-218-720-11	METAL CHIP	15K	0.50%	1/10W	R586	1-218-855-11	METAL CHIP	2.2K	0.50%	1/10W
R530	1-218-865-11	METAL CHIP	5.6K	0.50%	1/10W	R587	1-249-401-11	CARBON	47	5%	1/4W
R533	1-218-712-11	METAL CHIP	6.8K	0.50%	1/10W	R588	1-215-882-00	METAL OXIDE	22	5%	2W
R534	1-218-720-11	METAL CHIP	15K	0.50%	1/10W	R589	1-247-895-91	CARBON	470K	5%	1/4W
R535	1-218-865-11	METAL CHIP	5.6K	0.50%	1/10W	R590	1-249-429-11	CARBON	10K	5%	1/4W
R536	1-216-833-11	METAL CHIP	10K	5%	1/10W	R591	1-216-363-00	METAL OXIDE	0.33	5%	2W
R537	1-216-855-11	METAL CHIP	680K	5%	1/10W	R592	1-249-441-11	CARBON	100K	5%	1/4W
R539	1-216-864-11	SHORT CHIP				R593	1-249-429-11	CARBON	10K	5%	1/4W
R540	1-249-429-11	CARBON	10K	5%	1/4W	R594	1-249-418-11	CARBON	1.2K	5%	1/4W
R542	1-215-445-00	METAL	10K	1%	1/4W	R595	1-247-895-91	CARBON	470K	5%	1/4W
R543	1-216-368-11	METAL OXIDE	0.82	5%	2W	R596	1-249-377-11	CARBON	0.47	5%	1/4W
R544	1-249-389-11	CARBON	4.7	5%	1/4W	R597	1-216-849-11	METAL CHIP	220K	5%	1/10W
R545	1-215-890-11	METAL OXIDE	470	5%	2W	R598	1-249-377-11	CARBON	0.47	5%	1/4W
R546	1-249-385-11	CARBON	2.2	5%	1/4W	R601	1-240-262-11	CEMENTED	0.68	5%	10W
R547	1-215-445-00	METAL	10K	1%	1/4W	(KV-27FS120/29FA310LN/29FS120LN ONLY)					
R548	1-218-720-11	METAL CHIP	15K	0.50%	1/10W	R601	1-202-968-11	CEMENTED	1.2	5%	10W
R549	1-216-841-11	METAL CHIP	47K	5%	1/10W	(KV-29FS120LS/29FA310LS ONLY)					
R550	1-216-817-11	METAL CHIP	470	5%	1/10W	R602	1-240-262-11	CEMENTED	0.68	5%	10W
R551	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R602	1-202-968-11	CEMENTED	1.2	5%	10W
R553	1-216-821-11	METAL CHIP	1K	5%	1/10W	 R603	1-219-513-11	METAL	4.7M	5%	1/2W
R554	1-216-827-11	METAL CHIP	3.3K	5%	1/10W		(KV-27FS120/29FA310LN/29FS120LN ONLY)				
R555	1-216-833-11	METAL CHIP	10K	5%	1/10W	R604	1-216-821-11	METAL CHIP	1K	5%	1/10W
R556	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R605	1-216-833-11	METAL CHIP	10K	5%	1/10W
R557	1-216-825-11	METAL CHIP	2.2K	5%	1/10W	R606	1-216-833-11	METAL CHIP	10K	5%	1/10W
R560	1-216-821-11	METAL CHIP	1K	5%	1/10W	R607	1-216-857-11	METAL CHIP	1M	5%	1/10W
R561	1-216-833-11	METAL CHIP	10K	5%	1/10W	R608	1-215-924-00	METAL OXIDE	15K	5%	3W
R562	1-249-429-11	CARBON	10K	5%	1/4W	R609	1-202-962-11	CEMENTED	3.3	5%	10W
R563	1-218-871-11	METAL CHIP	10K	0.50%	1/10W	R611	1-240-262-11	CEMENTED	0.68	5%	10W
 R564	1-218-730-11	METAL CHIP	39K	0.50%	1/10W	(KV-27FS120/29FA310LN/29FS120LN ONLY)					
 R565	1-218-716-11	METAL CHIP	10K	0.50%	1/10W	R611	1-202-968-11	CEMENTED	1.2	5%	10W
 R566	1-215-469-00	METAL	100K	1%	1/4W	(KV-27FS120/29FA310LN/29FS120LN ONLY)					
R567	1-215-927-00	METAL OXIDE	47K	5%	3W	R611	1-202-968-11	CEMENTED	1.2	5%	10W
R568	1-215-399-00	METAL	120	1%	1/4W	R612	1-260-131-11	CEMENTED	470K	5%	1/2W
R569	1-249-429-11	CARBON	10K	5%	1/4W	R613	1-240-262-11	CEMENTED	0.68	5%	10W
R570	1-218-716-11	METAL CHIP	10K	0.50%	1/10W	(KV-27FS120/29FA310LN/29FS120LN ONLY)					
R572	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R613	1-202-968-11	CEMENTED	1.2	5%	10W
R573	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	(KV-27FS120/29FA310LN/29FS120LN ONLY)					
R574	1-216-833-11	METAL CHIP	10K	5%	1/10W	R613	1-202-968-11	CEMENTED	1.2	5%	10W
R575	1-249-389-11	CARBON	4.7	5%	1/4W	(KV-27FS120/29FA310LN/29FS120LN ONLY)					
R578	1-249-429-11	CARBON	10K	5%	1/4W	R614	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R581	1-249-441-11	CARBON	100K	5%	1/4W						

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A

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R615	1-202-933-61	FUSIBLE (KV-27FS120/29FS120LN/29FS120LS ONLY)	0.1	10%	1/2W	R667	1-216-833-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	10K	5%	1/10W
R616	1-216-821-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	1K	5%	1/10W	R668	1-249-418-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	1.2K	5%	1/4W
R617	1-216-821-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	1K	5%	1/10W	R670	1-216-833-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	10K	5%	1/10W
R619	1-249-389-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	4.7	5%	1/4W	R671	1-243-979-71	METAL OXIDE (KV-27FS120/29FS120LN/29FS120LS ONLY)	0.1	5%	2W
R620	1-216-353-00	METAL OXIDE (KV-27FS120/29FS120LN/29FS120LS ONLY)	2.2	5%	1W	R680	1-216-864-11	SHORT CHIP			
R625	1-249-413-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	470	5%	1/4W	R687	1-202-968-11	CEMENTED (KV-29FS120LS/29FA310LS ONLY)	1.2	5%	10W
R626	1-218-716-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	10K	0.50%	1/10W	R687	1-240-262-11	CEMENTED (KV-27FS120/29FA310LN/29FS120LN ONLY)	0.68	5%	10W
R627	1-215-481-00	METAL (KV-27FS120/29FS120LN/29FS120LS ONLY)	330K	1%	1/4W	⚠ R699	1-218-265-11	METAL CHIP (KV-29FS120LS/29FA310LS ONLY)	8.2M	5%	1W
R628	1-260-131-11	CEMENTED (KV-29FS120LS/29FA310LS ONLY)	470K	5%	1/2W	R801	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R629	1-215-481-00	METAL (KV-27FS120/29FS120LN/29FS120LS ONLY)	330K	1%	1/4W	R802	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R630	1-215-481-00	METAL (KV-27FS120/29FS120LN/29FS120LS ONLY)	330K	1%	1/4W	R803	1-218-719-11	METAL CHIP	13K	0.50%	1/10W
R631	1-218-718-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	12K	0.50%	1/10W	R812	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R632	1-216-809-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	100	5%	1/10W	R813	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R634	1-215-905-11	METAL OXIDE (KV-27FS120/29FS120LN/29FS120LS ONLY)	10	5%	3W	R814	1-218-736-11	METAL CHIP	68K	0.50%	1/10W
R640	1-249-417-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	1K	5%	1/4W	R815	1-218-732-11	METAL CHIP	47K	0.50%	1/10W
R641	1-202-968-11	CEMENTED (KV-29FS120LS/29FA310LS ONLY)	1.2	5%	10W	R850	1-215-453-00	METAL	22K	1%	1/4W
R641	1-240-262-11	CEMENTED (KV-27FS120/29FA310LN/29FS120LN ONLY)	0.68	5%	10W	⚠ R851	1-216-821-11	METAL CHIP	1K	5%	1/10W
R647	1-216-811-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	150	5%	1/10W	R852	1-218-889-11	METAL CHIP	56K	0.50%	1/10W
R650	1-249-415-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	680	5%	1/4W	R862	1-216-813-11	METAL CHIP	220	5%	1/10W
R651	1-249-441-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	100K	5%	1/4W	R890	1-216-843-11	METAL CHIP	68K	5%	1/10W
R652	1-249-441-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	100K	5%	1/4W	R893	1-216-864-11	SHORT CHIP			
R658	1-249-393-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	10	5%	1/4W	R901	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R659	1-249-393-11	CARBON (KV-27FS120/29FS120LN/29FS120LS ONLY)	10	5%	1/4W	<u>RELAY</u>					
R660	1-216-833-11	METAL CHIP (KV-27FS120/29FS120LN/29FS120LS ONLY)	10K	5%	1/10W	RY501	1-755-198-11	RELAY, AC POWER			
						⚠ RY600	1-755-395-11	RELAY (AC POWER)			
<u>SWITCH</u>											
						SW515	1-572-707-11	SWITCH, LEVER			
<u>TRANSFORMER</u>											
						T505	1-433-836-11	TRANSFORMER, HORIZONTAL DRIVE			
						⚠ T510	1-437-610-11	TRANSFORMER, FERRITE (PMT)			
						⚠ T511	1-433-850-11	TRANSFORMER, HORIZONTAL LINEAR			

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**A CW**

**KV-27FA310/27FS120/29FA310/29FS120**

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**CW**

REF. NO.	PART NO.	DESCRIPTION	VALUES	REF. NO.	PART NO.	DESCRIPTION	VALUES
D3773	8-719-404-50	DIODE	MA111-TX	Q3762	8-729-422-27	TRANSISTOR	2SD601A-Q
D3782	8-719-404-50	DIODE	MA111-TX	Q3763	8-729-422-27	TRANSISTOR	2SD601A-Q
D3783	8-719-404-50	DIODE	MA111-TX	Q3771	8-729-422-27	TRANSISTOR	2SD601A-Q
D3901	8-719-110-86	DIODE	RD39ESB	Q3772	8-729-422-27	TRANSISTOR	2SD601A-Q
D3902	8-719-110-86	DIODE	RD39ESB	Q3773	8-729-422-27	TRANSISTOR	2SD601A-Q
D3903	8-719-991-33	DIODE	1SS133T-77	Q3781	8-729-422-27	TRANSISTOR	2SD601A-Q
D3905	8-719-510-02	DIODE	D1NS4	Q3782	8-729-422-27	TRANSISTOR	2SD601A-Q
D3906	8-719-404-50	DIODE	MA111-TX	Q3783	8-729-422-27	TRANSISTOR	2SD601A-Q
D3907	8-719-404-50	DIODE	MA111-TX	Q3901	8-729-053-87	TRANSISTOR	KTC4370A
D3908	8-719-404-50	DIODE	MA111-TX	Q3902	6-550-247-01	TRANSISTOR	KTA1659A
<b>FERRITE BEAD</b>				Q3903	8-729-422-27	TRANSISTOR	2SD601A-Q
<b>FERRITE BEAD</b>				Q3904	8-729-422-27	TRANSISTOR	2SD601A-Q
FB3700	1-410-397-21	FERRITE	1.1 $\mu$ H	Q3905	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
FB3701	1-410-397-21	FERRITE	1.1 $\mu$ H	Q3906	8-729-120-28	TRANSISTOR	2SC1623-L5L6
FB3702	1-410-397-21	FERRITE	1.1 $\mu$ H	Q3907	8-729-120-28	TRANSISTOR	2SC1623-L5L6
FB3703	1-410-397-21	FERRITE	1.1 $\mu$ H	Q3908	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
<b>IC</b>				<b>RESISTOR</b>			
IC2751	8-759-562-43	IC	TDA6108JF/N1B	R2756	1-260-328-11	CARBON	1K 5% 1/2W
IC3701	8-759-803-42	IC	LA6500-FA	R2757	1-260-328-11	CARBON	1K 5% 1/2W
<b>JACK</b>				R2758	1-260-328-11	CARBON	1K 5% 1/2W
$\triangle$ J2751	1-451-544-11	SOCKET, CRT		R2760	1-260-087-11	CARBON	100 5% 1/2W
<b>CHIP CONDUCTOR</b>				R2761	1-216-375-00	METAL OXIDE	3.3 5% 2W
JR3910	1-216-864-11	SHORT CHIP		R2762	1-216-375-00	METAL OXIDE	3.3 5% 2W
<b>COIL</b>				R2763	1-247-807-31	CARBON	100 5% 1/4W
L2751	1-408-613-31	INDUCTOR	68 $\mu$ H	R2764	1-247-807-31	CARBON	100 5% 1/4W
L3710	1-410-387-11	INDUCTOR	33 $\mu$ H	R2765	1-247-807-31	CARBON	100 5% 1/4W
L3711	1-410-387-11	INDUCTOR	33 $\mu$ H	R2766	1-247-807-31	CARBON	100 5% 1/4W
L3712	1-410-387-11	INDUCTOR	33 $\mu$ H	R2767	1-247-807-31	CARBON	100 5% 1/4W
L3901	1-412-528-11	INDUCTOR	18 $\mu$ H	R2768	1-247-807-31	CARBON	100 5% 1/4W
<b>TRANSISTOR</b>				R2769	1-249-425-11	CARBON	4.7K 5% 1/4W
Q2772	8-729-422-27	TRANSISTOR	2SD601A-Q	R2770	1-249-433-11	CARBON	22K 5% 1/4W
Q3710	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX	R2785	1-216-833-11	METAL CHIP	10K 5% 1/10W
Q3711	8-729-422-27	TRANSISTOR	2SD601A-Q	R2788	1-249-421-11	CARBON	2.2K 5% 1/4W
Q3712	8-729-422-27	TRANSISTOR	2SD601A-Q	R2789	1-249-381-11	CARBON	1 5% 1/4W
Q3761	8-729-422-27	TRANSISTOR	2SD601A-Q	R3701	1-249-383-11	CARBON	1.5 5% 1/4W
<b>TRANSISTOR</b>				R3710	1-216-821-11	METAL CHIP	1K 5% 1/10W
<b>TRANSISTOR</b>				R3711	1-218-692-11	METAL CHIP	1K 0.50% 1/10W
<b>TRANSISTOR</b>				R3705	1-216-833-11	METAL CHIP	10K 5% 1/10W
<b>TRANSISTOR</b>				R3706	1-249-381-11	CARBON	1 5% 1/4W
<b>TRANSISTOR</b>				R3707	1-249-383-11	CARBON	1.5 5% 1/4W
<b>TRANSISTOR</b>				R3710	1-216-821-11	METAL CHIP	1K 5% 1/10W
<b>TRANSISTOR</b>				R3711	1-218-692-11	METAL CHIP	1K 0.50% 1/10W

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**CW** **D**

REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES							
R3712	1-218-690-11	METAL CHIP	820	0.50%	1/10W	R3914	1-216-820-11	METAL CHIP	820	5%	1/10W					
R3713	1-216-824-11	METAL CHIP	1.8K	5%	1/10W	R3915	1-216-829-11	METAL CHIP	4.7K	5%	1/10W					
R3714	1-216-821-11	METAL CHIP	1K	5%	1/10W	R3916	1-216-864-11	SHORT CHIP								
R3719	1-215-888-00	METAL OXIDE	220	5%	2W	R3917	1-216-829-11	METAL CHIP	4.7K	5%	1/10W					
R3760	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R3918	1-216-805-11	METAL CHIP	47	5%	1/10W					
R3762	1-218-692-11	METAL CHIP	1K	0.50%	1/10W	R3919	1-216-805-11	METAL CHIP	47	5%	1/10W					
R3763	1-216-835-11	METAL CHIP	15K	5%	1/10W	R3921	1-216-833-11	METAL CHIP	10K	5%	1/10W					
R3764	1-218-678-11	METAL CHIP	270	0.50%	1/10W	R3922	1-249-397-11	CARBON	22	5%	1/4W					
R3765	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W	R3923	1-249-401-11	CARBON	47	5%	1/4W					
R3766	1-216-827-11	METAL CHIP	3.3K	5%	1/10W	R3930	1-216-864-11	SHORT CHIP								
R3767	1-216-830-11	METAL CHIP	5.6K	5%	1/10W	R3931	1-249-421-11	CARBON	2.2K	5%	1/4W					
R3768	1-216-821-11	METAL CHIP	1K	5%	1/10W	R3932	1-218-696-11	METAL CHIP	1.5K	0.50%	1/10W					
R3769	1-216-821-11	METAL CHIP	1K	5%	1/10W	R3933	1-216-864-11	SHORT CHIP								
R3770	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R3935	1-249-405-11	CARBON	100	5%	1/4W					
R3771	1-216-821-11	METAL CHIP	1K	5%	1/10W	R3938	1-216-864-11	SHORT CHIP								
R3772	1-218-692-11	METAL CHIP	1K	0.50%	1/10W	<u>VARIABLE RESISTOR</u>										
R3773	1-216-835-11	METAL CHIP	15K	5%	1/10W	RV2701	1-238-019-11	RES, ADJ, CARBON 47K								
R3774	1-218-678-11	METAL CHIP	270	0.50%	1/10W	⚠ RV2750	1-241-656-11	RES, ADJ, METAL FILM 110M								
R3775	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W	<b>D</b>										
R3776	1-216-827-11	METAL CHIP	3.3K	5%	1/10W	*	<b>A-1415-635-A D BOARD, MOUNTED</b> (ALL EXCEPT KV-27FA310/29FA310)									
R3777	1-216-830-11	METAL CHIP	5.6K	5%	1/10W	*										
R3778	1-216-821-11	METAL CHIP	1K	5%	1/10W	⚠ 1-900-807-96 WIRE ASSY, G2 LEAD 180										
R3779	1-216-821-11	METAL CHIP	1K	5%	1/10W	<u>CAPACITOR</u>										
R3780	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	C1815	1-129-718-00	FILM	0.022μF	5%	630V					
R3782	1-218-692-11	METAL CHIP	1K	0.50%	1/10W	C1816	1-102-244-00	CERAMIC	220pF	10%	500V					
R3783	1-216-835-11	METAL CHIP	15K	5%	1/10W	C1817	1-129-709-91	FILM	0.0039μF	5%	630V					
R3784	1-218-678-11	METAL CHIP	270	0.50%	1/10W	C1818	1-164-645-11	CERAMIC	1000pF	10%	500V					
R3785	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W	C1819	1-102-244-00	CERAMIC	220pF	10%	500V					
R3786	1-216-827-11	METAL CHIP	3.3K	5%	1/10W	C1820	1-109-954-11	ELECT	0.47μF	20%	160V					
R3787	1-216-830-11	METAL CHIP	5.6K	5%	1/10W	C1815										
R3788	1-216-821-11	METAL CHIP	1K	5%	1/10W	C1816										
R3901	1-249-405-11	CARBON	100	5%	1/4W	C1817										
R3902	1-249-385-11	CARBON	2.2	5%	1/4W	C1818										
R3903	1-249-414-11	CARBON	560	5%	1/4W	C1819										
R3904	1-249-432-11	CARBON	18K	5%	1/4W	C1820										
R3905	1-249-421-11	CARBON	2.2K	5%	1/4W	<u>DIODE</u>										
R3906	1-249-432-11	CARBON	18K	5%	1/4W	D1809	8-719-110-41	DIODE								
R3907	1-249-385-11	CARBON	2.2	5%	1/4W	D1810	8-719-970-87	DIODE								
R3908	1-249-414-11	CARBON	560	5%	1/4W	D1811	8-719-970-87	DIODE								
R3909	1-260-316-51	CARBON	100	5%	1/2W	D1812	8-719-081-93	DIODE								
R3910	1-215-915-11	METAL OXIDE	470	5%	3W	D1809										
R3911	1-216-812-11	METAL CHIP	180	5%	1/10W	D1810										
R3912	1-216-811-11	METAL CHIP	150	5%	1/10W	D1811										
R3913	1-216-806-11	METAL CHIP	56	5%	1/10W	D1812										

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REF. NO.	PART NO.	DESCRIPTION	VALUES	REF. NO.	PART NO.	DESCRIPTION	VALUES	
		<u>COIL</u>		C1643	1-136-165-00	FILM	0.1 $\mu$ F 5% 50V	
L1805	1-406-677-11	INDUCTOR	10MH	C1645	1-136-479-11	FILM	0.001 $\mu$ F 5% 100V	
				C1647	1-126-947-11	ELECT	47 $\mu$ F 20% 35V	
				C1648	1-164-143-11	CERAMIC	0.001 $\mu$ F 10% 1KV	
				C1649	1-164-143-11	CERAMIC	0.001 $\mu$ F 10% 1KV	
		<u>TRANSISTOR</u>		C1650	1-100-120-51	ELECT	1000 $\mu$ F 20% 35V	
Q1810	8-729-043-95	TRANSISTOR	2SC3840(3)	C1652	1-137-374-11	MYLAR	0.047 $\mu$ F 5% 50V	
				C1669	1-164-625-11	CERAMIC	680pF 10% 500V	
				C1670	1-164-625-11	CERAMIC	680pF 10% 500V	
		<u>RESISTOR</u>		C1672	1-165-953-11	FILM	47000pF 3% 800V	
R1845	1-249-441-11	CARBON	100K 5% 1/4W	C1680	1-117-228-71	MYLAR	2.2 $\mu$ F 10% 450V	
R1846	1-249-441-11	CARBON	100K 5% 1/4W	C1815	1-129-718-00	FILM	0.022 $\mu$ F 5% 630V	
R1847	1-249-441-11	CARBON	100K 5% 1/4W	C1816	1-102-244-00	CERAMIC	220pF 10% 500V	
R1848	1-215-894-11	METAL OXIDE	2.2K 5% 2W	C1817	1-129-709-91	FILM	0.0039 $\mu$ F 5% 630V	
R1849	1-215-923-00	METAL OXIDE	10K 5% 3W	C1818	1-164-645-11	CERAMIC	1000pF 10% 500V	
R1850	1-215-923-00	METAL OXIDE	10K 5% 3W	C1819	1-102-244-00	CERAMIC	220pF 10% 500V	
R1851	1-215-922-11	METAL OXIDE	6.8K 5% 3W	C1820	1-109-954-11	ELECT	0.47 $\mu$ F 20% 160V	
R1852	1-215-922-11	METAL OXIDE	6.8K 5% 3W					
		<u>TRANSFORMER</u>				<u>CONNECTOR</u>		
T1801	1-433-533-12	TRANSFORMER, FERRITE (DFT)		*	CN1600	1-580-843-11	PIN, CONNECTOR (POWER)	
<b>GD</b>								
*	<b>A-1410-927-A GD (COM) BOARD, MOUNTED (KV-27FA310/29FA310 ONLY)</b>					<u>DIODE</u>		
$\triangle$	1-900-807-96	WIRE ASSY, G2 LEAD 180			D1611	8-719-062-40	DIODE	D4SBL20 $\mu$ F3
	4-382-854-11	SCREW (M3X10), P, SW (+)			D1614	8-719-057-52	DIODE	EZ0150AV1
					D1615	8-719-062-40	DIODE	D4SBL20 $\mu$ F3
					D1618	8-719-979-64	DIODE	$\mu$ F4005PKG23
					D1621	6-500-181-01	DIODE	MA6D50
					D1631	6-500-175-01	DIODE	1E3-TB
					D1809	8-719-110-41	DIODE	RD15ESB2
					D1810	8-719-970-87	DIODE	ERA38-06
		<u>CAPACITOR</u>			D1811	8-719-970-87	DIODE	ERA38-06
C1602	1-137-150-11	FILM	0.01 $\mu$ F 5% 100V		D1812	8-719-081-93	DIODE	1N4937/23
C1604	1-164-625-11	CERAMIC	680pF 10% 500V					
C1609	1-164-625-11	CERAMIC	680pF 10% 500V					
C1616	1-126-943-11	ELECT	2200 $\mu$ F 20% 25V					
C1617	1-123-024-21	ELECT	33 $\mu$ F 160V			<u>FERRITE BEAD</u>		
C1620	1-137-150-11	FILM	0.01 $\mu$ F 5% 100V		FB1602	1-410-397-21	FERRITE	1.1 $\mu$ H
C1624	1-107-636-11	ELECT	10 $\mu$ F 20% 160V		FB1604	1-410-397-21	FERRITE	1.1 $\mu$ H
C1633	1-136-479-11	FILM	0.001 $\mu$ F 5% 100V		FB1609	1-410-397-21	FERRITE	1.1 $\mu$ H
C1634	1-126-964-11	ELECT	10 $\mu$ F 20% 50V		FB1616	1-410-397-21	FERRITE	1.1 $\mu$ H
C1635	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V		FB1617	1-410-397-21	FERRITE	1.1 $\mu$ H
C1637	1-136-165-00	FILM	0.1 $\mu$ F 5% 50V					
C1642	1-126-969-11	ELECT	220 $\mu$ F 20% 50V					

GD HR

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

REF. NO.	PART NO.	DESCRIPTION	VALUES	REF. NO.	PART NO.	DESCRIPTION	VALUES	
		<u>IC</u>		R1660	1-249-429-11	CARBON	10K 5% 1/4W	
IC1600	6-705-810-01	IC	MCZ3001DB	R1667	1-249-429-11	CARBON	10K 5% 1/4W	
IC1601	8-749-012-13	IC	DM-58	R1668	1-249-418-11	CARBON	1.2K 5% 1/4W	
				R1670	1-249-429-11	CARBON	10K 5% 1/4W	
				R1671	1-243-979-71	METAL OXIDE	0.1 5% 2W	
		<u>COIL</u>		R1672	1-243-979-71	METAL OXIDE	0.1 5% 2W	
L1600	1-406-977-21	INDUCTOR	100µH	R1845	1-249-441-11	CARBON	100K 5% 1/4W	
L1604	1-412-525-31	INDUCTOR	10µH	R1846	1-249-441-11	CARBON	100K 5% 1/4W	
L1608	1-412-529-81	INDUCTOR	22µH	R1847	1-249-441-11	CARBON	100K 5% 1/4W	
L1805	1-406-677-11	INDUCTOR	10MH	R1848	1-215-894-11	METAL OXIDE	2.2K 5% 2W	
				R1849	1-215-923-00	METAL OXIDE	10K 5% 3W	
		<u>PHOTO COUPLER</u>		R1850	1-215-923-00	METAL OXIDE	10K 5% 3W	
PH1602	8-749-924-35	PHOTO COUPLER	ON3171-R	R1851	1-215-922-11	METAL OXIDE	6.8K 5% 3W	
				R1852	1-215-922-11	METAL OXIDE	6.8K 5% 3W	
		<u>IC LINK</u>				<u>TRANSFORMER</u>		
PS1401	1-576-337-21	IC LINK	2.7A 50V	 T1604	1-437-606-12	COVERTER TRANSFORMER		
				T1801	1-433-533-12	TRANSFORMER, FERRITE (DFT)		
		<u>TRANSISTOR</u>						
Q1600	8-729-052-32	TRANSISTOR	IRFB7N50A-LF31					
Q1601	8-729-052-32	TRANSISTOR	IRFB7N50A-LF31					
Q1810	8-729-043-95	TRANSISTOR	2SC3840(3)					
		<u>RESISTOR</u>						
 R1615	1-202-933-61	FUSIBLE	0.1 10% 1/2W			<u>CAPACITOR</u>		
R1616	1-249-418-11	CARBON	1.2K 5% 1/4W	C3001	1-104-665-11	ELECT	100µF 20% 25V	
R1617	1-249-417-11	CARBON	1K 5% 1/4W					
R1619	1-249-377-11	CARBON	0.47 5% 1/4W			<u>CONNECTOR</u>		
R1620	1-215-857-71	METAL OXIDE	10 5% 1W	*	CN3001	1-564-521-11	PLUG, CONNECTOR	6P
R1625	1-249-413-11	CARBON	470 5% 1/4W					
R1626	1-215-443-00	METAL	8.2K 1% 1/4W			<u>DIODE</u>		
R1629	1-245-478-21	METAL	470K 1% 1/4W	D3001	8-719-109-89	DIODE	RD5.6ESB2	
R1630	1-245-478-21	METAL	470K 1% 1/4W	D3002	8-719-057-09	DIODE	LNJ801LPDJA	
R1631	1-215-449-00	METAL	15K 1% 1/4W					
R1632	1-215-397-00	METAL	100 1% 1/4W			<u>IC</u>		
R1640	1-249-417-11	CARBON	1K 5% 1/4W	IC3001	8-742-211-20	HYB IC	SBX3071-71	
R1647	1-215-396-00	METAL	91 1% 1/4W					
R1650	1-249-441-11	CARBON	100K 5% 1/4W					
R1651	1-249-441-11	CARBON	100K 5% 1/4W					
R1658	1-249-393-11	CARBON	10 5% 1/4W					
R1659	1-249-393-11	CARBON	10 5% 1/4W					



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
		<b><u>RESISTOR</u></b>				R1009	1-249-421-11	CARBON	2.2K	5%	1/4W
R3001	1-249-417-11	CARBON	1K	5%	1/4W	R1010	1-249-416-11	CARBON	820	5%	1/4W
R3014	1-247-807-31	CARBON	100	5%	1/4W	R1011	1-249-415-11	CARBON	680	5%	1/4W
						R1201	1-249-419-11	CARBON	1.5K	5%	1/4W
						R1202	1-249-421-11	CARBON	2.2K	5%	1/4W
		<b><u>SWITCH</u></b>				R1203	1-249-427-11	CARBON	6.8K	5%	1/4W
S3006	1-786-338-12	SWITCH, TACTILE				R1234	1-247-804-11	CARBON	75	5%	1/4W
						R1235	1-249-409-11	CARBON	220	5%	1/4W
						R1236	1-249-441-11	CARBON	100K	5%	1/4W
						R1237	1-249-409-11	CARBON	220	5%	1/4W
						R1238	1-249-441-11	CARBON	100K	5%	1/4W
											
*	A-1415-674-A HS BOARD, MOUNTED (ALL EXCEPT KV-27FA310/29FA310)					<b><u>SWITCH</u></b>					
		<b><u>CAPACITOR</u></b>				S1001	1-692-431-21	SWITCH, TACTILE			
C1001	1-104-665-11	ELECT	100µF	20%	25V	S1002	1-692-431-21	SWITCH, TACTILE			
C1234	1-126-960-11	ELECT	1µF	20%	50V	S1003	1-692-431-21	SWITCH, TACTILE			
C1235	1-126-960-11	ELECT	1µF	20%	50V	S1004	1-692-431-21	SWITCH, TACTILE			
						S1005	1-692-431-21	SWITCH, TACTILE			
		<b><u>DIODE</u></b>				S1006	1-692-431-21	SWITCH, TACTILE			
D1001	8-719-929-15	DIODE	HYS9.1NB2			S1007	1-762-816-11	SWITCH, TACTILE			
D1002	8-719-070-80	DIODE	LNK0120022G			S1008	1-762-816-11	SWITCH, TACTILE			
D1003	8-719-929-15	DIODE	HYS9.1NB2								
D1004	8-719-109-89	DIODE	RD5.6ESB2								
D1005	8-719-109-89	DIODE	RD5.6ESB2								
D1233	8-719-108-12	DIODE	RD9.1EW								
D1235	8-719-108-12	DIODE	RD9.1EW								
D1236	8-719-108-12	DIODE	RD9.1EW								
		<b><u>IC</u></b>						<b><u>DIODE</u></b>			
IC1001	8-742-212-20	HYB IC	SBX3081-71			D301	8-719-108-12	DIODE	RD9.1EW		
						D2235	8-719-108-12	DIODE	RD9.1EW		
		<b><u>JACK</u></b>				D2236	8-719-108-12	DIODE	RD9.1EW		
J1231	1-794-048-11	JACK, PIN 3P				D2240	8-719-110-17	DIODE	RD10ESB2		
						D2241	8-719-110-17	DIODE	RD10ESB2		
		<b><u>RESISTOR</u></b>									
R1004	1-249-417-11	CARBON	1K	5%	1/4W			<b><u>JACK</u></b>			
R1007	1-247-807-31	CARBON	100	5%	1/4W	J2231	1-794-048-11	JACK, PIN 3P			
R1008	1-249-427-11	CARBON	6.8K	5%	1/4W						



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
<b><u>RESISTOR</u></b>											
R1001	1-249-427-11	CARBON	6.8K	5%	1/4W	C2414	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
R1002	1-249-421-11	CARBON	2.2K	5%	1/4W	C2415	1-126-967-11	ELECT	47 $\mu$ F	20%	50V
R1003	1-249-419-11	CARBON	1.5K	5%	1/4W	C2416	1-164-172-11	CERAMIC CHIP	0.0056 $\mu$ F	10%	25V
R2008	1-249-427-11	CARBON	6.8K	5%	1/4W	C2417	1-162-968-11	CERAMIC CHIP	0.0047 $\mu$ F	10%	50V
R2009	1-249-421-11	CARBON	2.2K	5%	1/4W	C2418	1-125-891-11	CERAMIC CHIP	0.47 $\mu$ F	10%	10V
R2010	1-249-416-11	CARBON	820	5%	1/4W	C2419	1-127-715-91	CERAMIC CHIP	0.22 $\mu$ F	10%	16V
R2011	1-249-415-11	CARBON	680	5%	1/4W	C2420	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V
R2235	1-249-409-11	CARBON	220	5%	1/4W	C2421	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V
R2236	1-249-441-11	CARBON	100K	5%	1/4W	C2422	1-127-715-91	CERAMIC CHIP	0.22 $\mu$ F	10%	16V
R2237	1-249-409-11	CARBON	220	5%	1/4W	C2423	1-165-176-11	CERAMIC CHIP	0.047 $\mu$ F	10%	16V
R2238	1-249-441-11	CARBON	100K	5%	1/4W	C2424	1-162-969-11	CERAMIC CHIP	0.0068 $\mu$ F	10%	25V
R2240	1-247-804-11	CARBON	75	5%	1/4W	C2425	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
						C2426	1-162-927-11	CERAMIC CHIP	100pF	5%	50V
						C2427	1-126-947-11	ELECT	47 $\mu$ F	20%	35V
						C2428	1-126-943-11	ELECT	2200 $\mu$ F	20%	25V
<b><u>SWITCH</u></b>											
S1007	1-762-816-11	SWITCH, TACTILE				C2429	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
S1008	1-762-816-11	SWITCH, TACTILE				C2430	1-126-960-11	ELECT	1 $\mu$ F	20%	50V
S2001	1-692-431-21	SWITCH, TACTILE				C2431	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
S2002	1-692-431-21	SWITCH, TACTILE				C2432	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
S2003	1-692-431-21	SWITCH, TACTILE				C2433	1-127-715-91	CERAMIC CHIP	0.22 $\mu$ F	10%	16V
S2004	1-692-431-21	SWITCH, TACTILE				C2434	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
S2005	1-692-431-21	SWITCH, TACTILE				C2435	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
<b><u>K</u></b>											
*	A-1410-921-A	K BOARD, MOUNTED (KV-27FA310/29FA310 ONLY)				C2436	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
	4-382-854-11	SCREW (M3X10), P, SW (+)				C2437	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
						C2438	1-164-227-11	CERAMIC CHIP	0.022 $\mu$ F	10%	25V
<b><u>CAPACITOR</u></b>											
C2401	1-130-495-00	MYLAR	0.1 $\mu$ F	5%	50V	C2439	1-164-227-11	CERAMIC CHIP	0.022 $\mu$ F	10%	25V
C2402	1-130-495-00	MYLAR	0.1 $\mu$ F	5%	50V	C2440	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
C2403	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C2441	1-115-412-11	CERAMIC CHIP	680pF	5%	25V
C2404	1-162-968-11	CERAMIC CHIP	0.0047 $\mu$ F	10%	50V	C2442	1-165-176-11	CERAMIC CHIP	0.047 $\mu$ F	10%	16V
C2405	1-126-965-91	ELECT	22 $\mu$ F	20%	50V	C2443	1-115-412-11	CERAMIC CHIP	680pF	5%	25V
C2406	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C2444	1-165-176-11	CERAMIC CHIP	0.047 $\mu$ F	10%	16V
C2407	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C2445	1-126-965-91	ELECT	22 $\mu$ F	20%	50V
C2408	1-162-969-11	CERAMIC CHIP	0.0068 $\mu$ F	10%	25V	C2446	1-130-495-00	MYLAR	0.1 $\mu$ F	5%	50V
C2409	1-126-969-11	ELECT	220 $\mu$ F	20%	50V	C2447	1-130-495-00	MYLAR	0.1 $\mu$ F	5%	50V
C2410	1-126-965-91	ELECT	22 $\mu$ F	20%	50V	C2448	1-137-190-91	FILM	0.22 $\mu$ F	5%	50V
C2411	1-126-965-91	ELECT	22 $\mu$ F	20%	50V	C2449	1-165-176-11	CERAMIC CHIP	0.047 $\mu$ F	10%	16V
C2412	1-137-194-81	FILM	0.47 $\mu$ F	5%	50V	C2450	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
C2413	1-100-120-51	ELECT	1000 $\mu$ F	20%	35V	C2451	1-162-967-11	CERAMIC CHIP	0.0033 $\mu$ F	10%	50V
						C2452	1-164-677-11	CERAMIC CHIP	0.033 $\mu$ F	10%	16V
						C2453	1-162-968-11	CERAMIC CHIP	0.0047 $\mu$ F	10%	50V
						C2454	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
						C2455	1-107-826-11	CERAMIC CHIP	0.1 $\mu$ F	10%	16V
						C2456	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
						C2457	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
C2458	1-126-963-11	ELECT	4.7µF	20%	50V			<u>DIODE</u>			
C2459	1-126-965-91	ELECT	22µF	20%	50V	D2400	8-719-404-50	DIODE	MA111-TX		
C2460	1-137-194-81	FILM	0.47µF	5%	50V	D2401	8-719-070-60	DIODE	PDZ7.5B-115		
C2461	1-126-963-11	ELECT	4.7µF	20%	50V						
C2462	1-126-963-11	ELECT	4.7µF	20%	50V						
C2463	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V			<u>IC</u>			
C2464	1-126-960-11	ELECT	1µF	20%	50V	IC2401	6-705-054-01	IC	TDA8947J		
C2465	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V	IC2402	8-759-100-96	IC	UPC4558G2		
C2466	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V	IC2403	6-706-034-01	IC	NJW1164M-TE2		
C2467	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V	IC2404	8-759-165-01	IC	NJM2177AFG1		
C2468	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V	IC2405	8-759-686-15	IC	NJM2180M (TE2)		
C2469	1-130-495-00	MYLAR	0.1µF	5%	50V			<u>CHIP CONDUCTOR</u>			
C2470	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V	JR2401	1-216-864-11	SHORT CHIP			
C2471	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V	JR2402	1-216-864-11	SHORT CHIP			
C2472	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V	JR2410	1-216-864-11	SHORT CHIP			
C2473	1-126-964-11	ELECT	10µF	20%	50V	JR2411	1-216-864-11	SHORT CHIP			
C2474	1-126-964-11	ELECT	10µF	20%	50V	JR2420	1-216-864-11	SHORT CHIP			
C2475	1-126-968-11	ELECT	100µF	20%	50V	JR2421	1-216-864-11	SHORT CHIP			
C2476	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V			<u>IC LINK</u>			
C2477	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V						
C2478	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V						
C2479	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V	PS2401	1-576-337-21	IC LINK	2.7A	50V	
C2480	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V						
C2481	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V			<u>TRANSISTOR</u>			
C2482	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V	Q2400	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
C2484	1-130-495-00	MYLAR	0.1µF	5%	50V	Q2401	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
C2485	1-130-495-00	MYLAR	0.1µF	5%	50V	Q2410	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2486	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V	Q2411	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2487	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V	Q2412	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2488	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V	Q2413	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2489	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V	Q2414	8-729-422-27	TRANSISTOR	2SD601A-Q		
C2490	1-104-665-11	ELECT	100µF	20%	25V	Q2418	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
C2493	1-126-935-11	ELECT	470µF	20%	16V	Q2419	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
C2494	1-126-935-11	ELECT	470µF	20%	16V			<u>RESISTOR</u>			
C2495	1-126-935-11	ELECT	470µF	20%	16V	R2401	1-216-845-11	METAL CHIP	100K	5%	1/10W
C2496	1-126-935-11	ELECT	470µF	20%	16V	R2402	1-216-833-11	METAL CHIP	10K	5%	1/10W
C2499	1-164-315-11	CERAMIC CHIP	470pF	5%	50V	R2403	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
<u>CONNECTOR</u>											
*	CN2401	1-564-510-11	PLUG, CONNECTOR	7P		R2404	1-216-835-11	METAL CHIP	15K	5%	1/10W
*	CN2402	1-564-508-11	PLUG, CONNECTOR	5P		R2405	1-218-895-11	METAL CHIP	100K	0.50%	1/10W
						R2406	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
						R2407	1-216-835-11	METAL CHIP	15K	5%	1/10W



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2408	1-218-868-11	METAL CHIP	7.5K	0.50%	1/10W	R2454	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2409	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2455	1-216-809-11	METAL CHIP	100	5%	1/10W
R2410	1-216-835-11	METAL CHIP	15K	5%	1/10W	R2456	1-216-809-11	METAL CHIP	100	5%	1/10W
R2411	1-216-841-11	METAL CHIP	47K	5%	1/10W	R2457	1-216-864-11	SHORT CHIP			
R2412	1-218-868-11	METAL CHIP	7.5K	0.50%	1/10W	R2458	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R2413	1-216-841-11	METAL CHIP	47K	5%	1/10W	R2459	1-216-853-11	METAL CHIP	470K	5%	1/10W
R2414	1-216-835-11	METAL CHIP	15K	5%	1/10W	R2460	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W
R2415	1-220-397-11	METAL CHIP	4.7M	5%	1/10W	R2461	1-216-839-11	METAL CHIP	33K	5%	1/10W
R2416	1-216-837-11	METAL CHIP	22K	5%	1/10W	R2462	1-218-296-11	METAL CHIP	75K	5%	1/10W
R2417	1-216-837-11	METAL CHIP	22K	5%	1/10W	R2463	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2418	1-216-809-11	METAL CHIP	100	5%	1/10W	R2464	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2419	1-216-809-11	METAL CHIP	100	5%	1/10W	R2465	1-216-824-11	METAL CHIP	1.8K	5%	1/10W
R2420	1-216-837-11	METAL CHIP	22K	5%	1/10W	R2466	1-218-866-11	METAL CHIP	6.2K	0.50%	1/10W
R2421	1-216-837-11	METAL CHIP	22K	5%	1/10W	R2467	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2422	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2468	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2423	1-216-840-11	METAL CHIP	39K	5%	1/10W	R2469	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2424	1-216-840-11	METAL CHIP	39K	5%	1/10W	R2470	1-216-840-11	METAL CHIP	39K	5%	1/10W
R2425	1-216-840-11	METAL CHIP	39K	5%	1/10W	R2471	1-216-824-11	METAL CHIP	1.8K	5%	1/10W
R2426	1-216-817-11	METAL CHIP	470	5%	1/10W	R2472	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2427	1-216-817-11	METAL CHIP	470	5%	1/10W	R2473	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R2428	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R2474	1-216-839-11	METAL CHIP	33K	5%	1/10W
R2429	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	R2475	1-218-296-11	METAL CHIP	75K	5%	1/10W
R2430	1-216-809-11	METAL CHIP	100	5%	1/10W	R2476	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2431	1-216-809-11	METAL CHIP	100	5%	1/10W	R2477	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2432	1-216-864-11	SHORT CHIP				R2478	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2433	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2479	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2434	1-218-895-11	METAL CHIP	100K	0.50%	1/10W	R2480	1-218-331-11	METAL CHIP	51K	5%	1/10W
R2435	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2481	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R2436	1-216-821-11	METAL CHIP	1K	5%	1/10W	R2482	1-216-833-11	METAL CHIP	10K	5%	1/10W
R2437	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2483	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2438	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2484	1-216-828-11	METAL CHIP	3.9K	5%	1/10W
R2439	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2485	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2440	1-216-837-11	METAL CHIP	22K	5%	1/10W	R2486	1-216-821-11	METAL CHIP	1K	5%	1/10W
R2441	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2487	1-218-717-11	METAL CHIP	11K	0.50%	1/10W
R2442	1-216-821-11	METAL CHIP	1K	5%	1/10W	R2488	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R2443	1-216-841-11	METAL CHIP	47K	5%	1/10W	R2489	1-216-835-11	METAL CHIP	15K	5%	1/10W
R2446	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2490	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2447	1-216-821-11	METAL CHIP	1K	5%	1/10W	R2491	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2448	1-216-845-11	METAL CHIP	100K	5%	1/10W	R2492	1-216-837-11	METAL CHIP	22K	5%	1/10W
R2449	1-216-841-11	METAL CHIP	47K	5%	1/10W	R2493	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2450	1-216-833-11	METAL CHIP	10K	5%	1/10W	R2494	1-216-845-11	METAL CHIP	100K	5%	1/10W
R2451	1-216-845-11	METAL CHIP	100K	5%	1/10W	R2495	1-218-292-11	METAL CHIP	20K	5%	1/10W
R2452	1-216-821-11	METAL CHIP	1K	5%	1/10W	R2496	1-216-847-11	METAL CHIP	150K	5%	1/10W
R2453	1-216-841-11	METAL CHIP	47K	5%	1/10W	R2497	1-216-823-11	METAL CHIP	1.5K	5%	1/10W

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REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2498	1-216-837-11	METAL CHIP	22K	5%	1/10W			<u>DIODE</u>			
R2499	1-216-837-11	METAL CHIP	22K	5%	1/10W	D2801	8-719-109-89	DIODE	RD5.6ESB2		
R2500	1-216-829-11	METAL CHIP	4.7K	5%	1/10W	D2802	8-719-991-33	DIODE	1SS133T-77		
R2501	1-216-837-11	METAL CHIP	22K	5%	1/10W	D2804	8-719-302-43	DIODE	EL1Z		
R2502	1-216-837-11	METAL CHIP	22K	5%	1/10W	D2805	8-719-991-33	DIODE	1SS133T-77		
R2503	1-216-837-11	METAL CHIP	22K	5%	1/10W	D2806	8-719-991-33	DIODE	1SS133T-77		
R2504	1-216-837-11	METAL CHIP	22K	5%	1/10W	D2807	8-719-210-21	DIODE	11EQS04		
R2505	1-216-841-11	METAL CHIP	47K	5%	1/10W	D2808	8-719-991-33	DIODE	1SS133T-77		
R2507	1-216-809-11	METAL CHIP	100	5%	1/10W	D2813	8-719-991-33	DIODE	1SS133T-77		
R2519	1-216-821-11	METAL CHIP	1K	5%	1/10W						
R2520	1-216-821-11	METAL CHIP	1K	5%	1/10W			<u>IC</u>			
R2521	1-216-833-11	METAL CHIP	10K	5%	1/10W	IC2801	6-701-598-01	IC	UPC5023CS-184		
R2522	1-216-841-11	METAL CHIP	47K	5%	1/10W						
R2523	1-216-841-11	METAL CHIP	47K	5%	1/10W						
R2524	1-216-864-11	SHORT CHIP									
<u>CAPACITOR</u>											
C2801	1-128-578-11	ELECT	1μF	20%	100V	Q2801	8-729-422-27	TRANSISTOR	2SD601A-Q		
C2802	1-126-964-11	ELECT	10μF	20%	50V	Q2802	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2803	1-137-378-11	MYLAR	0.22μF	5%	50V	Q2803	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2804	1-137-378-11	MYLAR	0.22μF	5%	50V	Q2804	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX		
C2805	1-129-745-61	FILM	0.033μF	5%	400V	Q2805	6-550-106-01	TRANSISTOR	KTB764		
C2808	1-162-970-11	CERAMIC CHIP	0.01μF	10%	25V	Q2807	8-729-931-45	TRANSISTOR	IRF614		
C2809	1-128-934-91	CERAMIC CHIP	0.33μF	20%	10V	Q2808	6-550-106-01	TRANSISTOR	KTB764		
C2810	1-130-495-00	MYLAR	0.1μF	5%	50V	Q2812	8-729-026-39	TRANSISTOR	2SA933AS-QT		
C2811	1-129-725-00	FILM	0.082μF	5%	400V						
C2812	1-162-970-11	CERAMIC CHIP	0.01μF	10%	25V						
<u>CONNECTOR</u>											
*	CN2901	1-564-507-11	PLUG, CONNECTOR	4P		R2800	1-216-837-11	METAL CHIP	22K	5%	1/10W
*	CN2902	1-770-723-11	CONNECTOR, BOARD TO BOARD	8P		R2801	1-216-841-11	METAL CHIP	47K	5%	1/10W
*	CN2903	1-564-506-11	PLUG, CONNECTOR	3P		R2802	1-216-833-11	METAL CHIP	10K	5%	1/10W
						R2803	1-216-837-11	METAL CHIP	22K	5%	1/10W
						R2804	1-216-833-11	METAL CHIP	10K	5%	1/10W
						R2805	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
						R2807	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
						R2808	1-216-833-11	METAL CHIP	10K	5%	1/10W
						R2809	1-216-837-11	METAL CHIP	22K	5%	1/10W
						R2811	1-249-393-11	CARBON	10	5%	1/4W



REF. NO.	PART NO.	DESCRIPTION	VALUES			REF. NO.	PART NO.	DESCRIPTION	VALUES		
R2815	1-215-862-11	METAL OXIDE	68	5%	1W			<u>ACCESSORIES AND PACKING</u>			
R2817	1-218-736-11	METAL CHIP	68K	0.50%	1/10W	*	4-041-259-05	BAG, PROTECTION			
R2818	1-216-809-11	METAL CHIP	100	5%	1/10W	*	2-190-595-01	CARTON, INDIVIDUAL (KV-27FA310 ONLY)			
R2819	1-216-841-11	METAL CHIP	47K	5%	1/10W	*	4-102-073-01	CARTON, INDIVIDUAL (KV-29FA310 ONLY)			
R2820	1-218-883-11	METAL CHIP	33K	0.50%	1/10W	*	4-103-469-01	CARTON, INDIVIDUAL (KV-27FS120 ONLY)			
R2821	1-218-714-11	METAL CHIP	8.2K	0.50%	1/10W	*	4-103-471-01	CARTON, INDIVIDUAL (KV-29FS120 ONLY)			
R2824	1-218-740-11	METAL CHIP	100K	0.50%	1/10W	*	4-088-874-01	CUSHION, LOWER (KV-27FS120/29FS120 ONLY)			
R2825	1-216-845-11	METAL CHIP	100K	5%	1/10W	*	4-102-075-01	CUSHION, LOWER (KV-27FA310/29FA310 ONLY)			
R2826	1-249-421-11	CARBON	2.2K	5%	1/4W	*	4-093-139-11	INSERT, DOOR BREAKAGE (L) (KV-27FA310 ONLY)			
R2827	1-218-708-11	METAL CHIP	4.7K	0.50%	1/10W						
R2828	1-218-728-11	METAL CHIP	33K	0.50%	1/10W	*	4-088-875-01	CUSHION, UPPER (KV-27FS120/29FS120 ONLY)			
R2829	1-216-853-11	METAL CHIP	470K	5%	1/10W	*	4-102-074-01	CUSHION, UPPER (KV-27FA310/29FA310 ONLY)			
R2833	1-218-710-11	METAL CHIP	5.6K	0.50%	1/10W	*	4-101-451-41	MANUAL, INSTRUCTION (KV-27FA310/29FA310 ONLY)			
R2834	1-218-704-11	METAL CHIP	3.3K	0.50%	1/10W	*	4-101-456-21	MANUAL, INSTRUCTION (KV-27FA310/29FA310 ONLY)			
R2837	1-218-871-11	METAL CHIP	10K	0.50%	1/10W	*	4-101-456-31	MANUAL, INSTRUCTION (KV-27FS120/27FA310 ONLY)			
R2840	1-218-702-11	METAL CHIP	2.7K	0.50%	1/10W						
R2841	1-218-706-11	METAL CHIP	3.9K	0.50%	1/10W	*	4-101-456-41	MANUAL, INSTRUCTION (KV-27FS120/27FA310 CANADA ONLY)			
R2842	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W	*	4-101-456-41	MANUAL, INSTRUCTION (KV-27FS120/27FA310 CANADA ONLY)			
R2855	1-218-706-11	METAL CHIP	3.9K	0.50%	1/10W	*	4-101-456-41	MANUAL, INSTRUCTION (KV-27FS120/27FA310 CANADA ONLY)			
R2856	1-218-871-11	METAL CHIP	10K	0.50%	1/10W						
R2857	1-218-875-11	METAL CHIP	15K	0.50%	1/10W						
R2860	1-218-716-11	METAL CHIP	10K	0.50%	1/10W						
R2864	1-218-668-11	METAL CHIP	100	0.50%	1/10W						
R2866	1-249-438-11	CARBON	56K	5%	1/4W						
R2870	1-216-825-11	METAL CHIP	2.2K	5%	1/10W						
R2876	1-216-821-11	METAL CHIP	1K	5%	1/10W						
R2890	1-218-728-11	METAL CHIP	33K	0.50%	1/10W						
R2893	1-216-839-11	METAL CHIP	33K	5%	1/10W						
<u>REMOTE COMMANDER</u>											
1-476-680-21      REMOTE COMMANDER (RM-Y180) (KV-27FA310/29FA310 ONLY)											
1-478-707-11      REMOTE COMMANDER (RM-Y195) (KV-27FS120/29FS120LN/29FS120LS ONLY)											
4-978-977-11      BATTERY COVER (FOR RM-Y180/Y195)											

# SERVICE MANUAL

**BA-6 CHASSIS**

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*In an effort to reduce the size of this pdf file the tiled schematics are not attached to this Service Manual. To receive a complete set of the tiled schematics for this manual please submit a request to Nita Wardlaw at [nita.wardlaw@am.sony.com](mailto:nita.wardlaw@am.sony.com).*

**SONY**<sup>®</sup>

4-101-456-21(2)



**FD Trinitron**  
**WEGA**<sup>®</sup>

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Operating Instructions

**KV-27FS120**



# WARNING

To reduce the risk of fire or electric shock, do not expose the TV to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

## Note to the CATV Installer

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

## SAFETY PRECAUTIONS

- Operate the TV only on 120 V AC.
- One blade of the power plug is wider than the other for safety purposes and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- If any liquid or solid object falls into the TV, unplug it and have it checked by qualified personnel before operating it further.

## CAUTION

When using TV games, computers, and similar products with your TV, keep the brightness and contrast functions at low settings. If a fixed (non-moving) pattern is left on the screen for long periods of time at a high brightness or contrast setting, the image can be permanently imprinted onto the screen. Continuously watching the same channel can cause the imprint of station logos onto the TV screen. These types of imprints are not covered by your warranty because they are the results of misuse.



To reduce the risk of electric shock, do not use this polarized plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.



You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

## NOTIFICATION

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antennas.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Protecting the TV

- To prevent internal heat build-up, do not block the ventilation openings.
- Do not install the TV in a hot or humid place, or in a place subject to excessive dust or mechanical vibration.

## Note on Caption Vision

This television receiver provides display of television closed captioning in accordance with § 15.119 of the FCC rules. Use of this television for other than private viewing of programs broadcast on UHF or VHF or transmitted by cable companies for the use of the general public may require authorization from the broadcaster-cable company and/or program owner.

## Owner's Record

The model and serial numbers are located on the front cover of this manual and at the rear of your TV.

## Trademarks and Copyrights

ENERGY STAR is a registered mark.



As an ENERGY STAR® Partner, Sony has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.



SRS and the (●)® symbol are trademarks of SRS Labs, Inc.



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WEGA, FD Trinitron, ClearEdge VM, Steady Sound and Caption Vision are registered trademarks of Sony Corporation.

# IMPORTANT SAFEGUARDS

For your protection, please read these instructions completely, and keep this manual for future reference. Carefully observe and comply with all warnings, cautions and instructions placed on the set, or described in the operating instructions or service manual.

## WARNING

To guard against injury, the following basic safety precautions should be observed in the installation, use, and servicing of the set.

## Use

### Power Sources

This set should be operated only from the type of power source indicated on the serial/model plate. If you are not sure of the type of electrical power supplied to your home, consult your dealer or local power company. For those sets designed to operate from battery power, refer to the operating instructions.



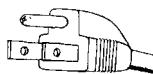
### Grounding or Polarization

This set may be equipped with a polarized alternating current line plug (a plug having one blade wider than other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.



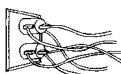
### For the set with a three-wire grounding type AC plug

This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to have a suitable outlet installed. Do not defeat the safety purpose of the grounding plug.



### Overloading

Do not overload wall outlets, extension cords or convenience receptacles beyond their capacity, since this can result in fire or electric shock.



Always turn the set off when it is not to be used. When the set is left unattended and unused for long periods of time, unplug it from the wall outlet as a precaution against the possibility of an internal malfunction that could create a fire hazard.

Do not disconnect the antenna or the power cord during a heavy storm. Lightning may strike while you are holding the cable or cord, causing serious injury. Turn off your TV and wait for the weather to improve.

### Object and Liquid Entry

Never push objects of any kind into the set through the cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the set.



## Attachments

Do not use attachments not recommended by the manufacturer, as they may cause hazards.

Do not place any objects, especially heavy objects, on top of the set. The object may fall from the set, causing injury.



## Cleaning

Unplug the set from the wall outlet before cleaning or polishing it. Do not use liquid cleaners or aerosol cleaners. Use a cloth lightly dampened with water for cleaning the exterior of the set.



If a snapping or popping sound from a TV set is continuous or frequent while the TV is operating, unplug the TV and consult your dealer or service technician. It is normal for some TV sets to make occasional snapping or popping sounds, particularly when being turned on or off.



## Installation

Always use two or more people to lift or move the set. The set is heavy and the bottom surface is flat. Serious injury can result from trying to move the set by yourself alone, or from unsteady handling.

Install the set on a stable, level surface.



### Water and Moisture

Do not use power-line operated sets near water — for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, etc.



### Accessories

Do not place the set on an unstable cart, stand, tripod, bracket, table, or shelf. The set may fall, causing serious injury to a child or an adult, and serious damage to the set. Use only a cart or stand recommended by the manufacturer for the specific model of TV. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



## Ventilation

The slots and openings in the cabinet and in the back or bottom are provided for necessary ventilation. To ensure reliable operation of the set, and to protect it from overheating, these slots and openings must never be blocked or covered.

- **Never cover the slots and openings with a cloth or other materials.**



- Never block the slots and openings by placing the set on a bed, sofa, rug or other similar surface.
- Never place the set in a confined space, such as a bookcase or built-in cabinet, unless proper ventilation is provided.
- Do not place the set near or over a radiator or heat register, or where it is exposed to direct sunlight.

### Power-Cord Protection

Do not allow anything to rest on or roll over the power cord, and do not place the set where the power cord is subject to wear or abuse.

### Antennas

#### Outdoor Antenna Grounding

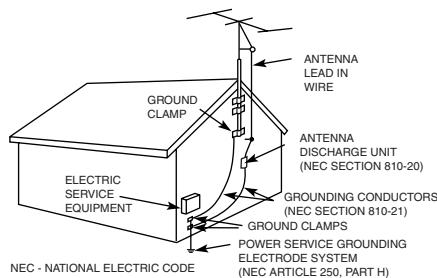
If an outdoor antenna is installed, follow the precautions below. An outdoor antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can come in contact with such power lines or circuits.

**WHEN INSTALLING AN OUTDOOR ANTENNA SYSTEM, EXTREME CARE SHOULD BE TAKEN TO KEEP FROM CONTACTING SUCH POWER LINES OR CIRCUITS AS CONTACT WITH THEM IS ALMOST INvariably FATAL.**

Be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code (NEC) in USA and Section 54 of the Canadian Electrical Code in Canada provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

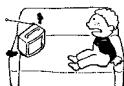
#### Antenna Grounding According to the NEC

Antenna Grounding According to the National Electrical Code, ANSI/NFPA 70.



### Lightning

For added protection for this television receiver during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage to the receiver due to lightning and power-line surges.

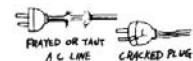


### Service

#### Damage Requiring Service

Unplug the set from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power cord or plug is damaged or frayed.



- If liquid has been spilled into the set or objects have fallen into the product.



- If the set has been exposed to rain or water.



- If the set has been subject to excessive shock by being dropped, or the cabinet has been damaged.



- If the set does not operate normally when following the operating instructions. Adjust only those controls that are specified in the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the set to normal operation.

- When the set exhibits a distinct change in performance — this indicates a need for service.

#### Servicing

Do not attempt to service the set yourself since opening the cabinet may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.



#### Replacement Parts

When replacement parts are required, be sure the service technician certifies in writing that he has used replacement parts specified by the manufacturer that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.



#### Safety Check

Upon completion of any service or repairs to the set, ask the service technician to perform routine safety checks (as specified by the manufacturer) to determine that the set is in safe operating condition, and to so certify. When the set reaches the end of its useful life, improper disposal could result in a picture tube implosion. Ask a qualified service technician to dispose of the set.





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# Introduction

Congratulations on your purchase of the Sony FD Trinitron WEGA®.

## Introducing the FD Trinitron WEGA® Features

Some of the features you will enjoy include:

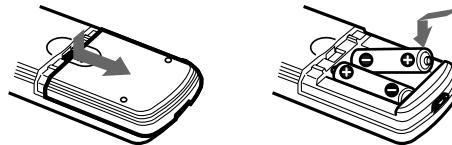
- ❑ **FD Trinitron Flat CRT** — Delivers a picture with uncompromising accuracy and outstanding image detail via a technologically advanced tube.
- ❑ **Y, Pb, Pr Inputs** — Provides component video inputs for superior picture quality (480i only).
- ❑ **BBE** — Gives sound more impact by using audio technology to compensate for phase effects in speakers.
- ❑ **SRS** — Produces a dynamic three-dimensional sound for stereo programs.
- ❑ **ClearEdge VM** — Sharpens picture definition to give objects a crisp, clean edge.
- ❑ **Favorite Channels** — Provides instant access to your favorite channels with the touch of a button.
- ❑ **Info Banner** — Displays the name and the remaining time of the current program viewed, if available.
- ❑ **Universal Remote Control** — Operates your connected cable box, VCR, digital satellite receiver, DVD player, or DVD/VCR combination unit.
- ❑ **Energy Star®** — Meets the Energy Star guidelines for energy efficiency.
- ❑ **Parental Control (V-Chip)** — Helps parents monitor what their children watch on TV by establishing rating limits.
- ❑ **Front Panel Controls** — Allows access to the on-screen menus without the use of a remote control.
- ❑ **Front A/V Inputs** — Lets you quickly connect video games, camcorders or stereo/mono equipment.
- ❑ **16:9 Enhanced** — Provides enhanced picture resolution for wide-screen sources such as DVD.

# About this Manual

This manual provides instructions to help you enjoy your new TV. It shows you how to connect to an antenna or cable, cable box, VCR, DVD, satellite receiver, stereo system, or camcorder. Once your TV is connected, follow the instructions and use the remote control to access the on-screen menus.

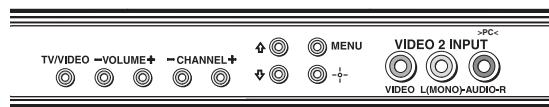
## Batteries for the Remote Control

Insert two AA (R6) batteries (supplied) into the remote control using the following illustration as a guide.



- ☞ Under normal conditions, batteries will last up to six months. If the remote control does not operate properly, the batteries might be worn out.
- ☞ If you will not be using the remote control for an extended period of time, remove the batteries to avoid possible damage from battery leakage.

## Front Panel Menu Controls



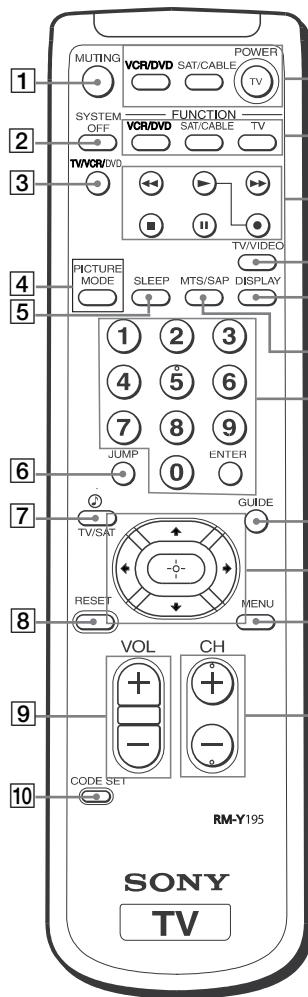
The front Audio/Video panel controls allow you to access the menu without the remote control.

- Press **MENU** to display the on-screen menu.
- Use the **↑** and **↓** buttons on the front Audio/Video panel instead of your remote control.
- Use the **⊕** button on the front Audio/Video panel to navigate through the menus, then select an item. The front panel controls also allow you to change your channels (CH+/-), adjust the volume (VOL +/-), and change video inputs.

☞ To navigate the menus with your remote control, see "Using the Menus" on page 27.

# Using the Remote Control

## Remote Control Description



Button	Description
<b>1</b> <b>MUTING</b>	Press to turn off the sound. Press again or press <b>VOL</b> (+) to restore sound.
<b>2</b> <b>SYSTEM OFF</b>	Press to turn off the equipment programmed into the remote control. See "Programming the Remote Control" on page 5. This button does not work with DVD/VCR combo units, and may not work with older Sony equipment.
<b>3</b> <b>TV/VCR/DVD</b>	Press to change the VHF/UHF output of the VCR (or DVD/VCR combination unit). If you have a non-Sony VCR or DVD, you will need to program the remote control to recognize your VCR or DVD. For details, see "Programming the Remote Control" on page 5.
<b>4</b> <b>PICTURE MODE</b>	Press repeatedly to step through the available video picture modes: Vivid, Standard, Movie and Pro. Also available in the Video menu. See "Using the Video Menu" on page 28 for details.
<b>5</b> <b>SLEEP</b>	Press repeatedly until the TV displays the time in minutes (15, 30, 45, 60, or 90) that you want the TV to remain on before shutting off automatically. Cancel by pressing until Sleep Off appears.
<b>6</b> <b>JUMP</b>	Press to jump back and forth between two channels. The TV alternates between the current channel and the last channel that you selected. JUMP will not work if any FUNCTION Mode (VCR/DVD, SAT/CABLE, TV) is activated.
<b>7</b> <b>TV/SAT</b>	Press to switch between the TV and SAT (satellite) inputs when in SAT FUNCTION mode.
<b>8</b> <b>RESET</b>	Press for a direct selection of Effect settings (Simulated, SRS, Off) when the remote is in TV FUNCTION mode. See "Using the Audio Menu" on page 29 for details.
<b>9</b> <b>VOL (volume)</b>	Press (+) or (-) to adjust the volume.
<b>10</b> <b>CODE SET</b>	Press to program your remote control to operate connected video equipment. See "Programming the Remote Control" on page 5.

Button	Description
11 <b>POWER buttons</b>	Press to turn on and off the TV and other audio/video equipment you have programmed into the remote control. For instructions, see "Programming the Remote Control" on page 5.
12 <b>FUNCTION buttons</b>	Press to select the equipment (VCR/DVD, SAT/CABLE, TV) that you want to operate with the remote control. The indicator (LED) lights up momentarily when pressed to show which device the remote control is operating.
13 <b>VCR (operating)</b>	Press to operate your VCR. The VCR must be programmed into the remote control. For instructions, see "Programming the Remote Control" on page 5.
14 <b>TV/VIDEO</b>	Press to cycle through available video inputs.
15 <b>DISPLAY</b>	Press once to display the current time (if set) and the program status such as channel number, Channel Label (if set), video input, and Video Label (if set). Press again to turn off the display.
16 <b>MTS/SAP</b>	Press to cycle through the Multi-channel TV Sound (MTS) options: Stereo, Auto SAP (Second Audio Programming), and Mono.
17 <b>0-9 and ENTER</b>	Press to change channels. The channel changes after two seconds.
18 <b>GUIDE</b>	Press to display the program guide of your satellite receiver.
19 	Press the arrow buttons to move the cursor in the on-screen menus. Press the center button to select an option.
20 <b>MENU</b>	Press to display the on-screen menu. Press again to exit the menu at any time.
21 <b>CH (channel)</b>	Press to change channels. To scan rapidly through the channels, press and hold down the CH+ or CH- button.



If you lose your remote control, see page 42.

## Programming the Remote Control

If you have video equipment other than Sony brand (or if you have a Sony DVD/VCR combination unit) that you want to control with the TV's remote control, use the following procedure to program the remote control.

**1** Check the list of "Manufacturer's Codes" on page 6 and find the three-digit code number for the manufacturer of your component. If more than one code number is listed, use the number listed first.

**2** Press .

 The  and  FUNCTION button will flash when you press .

**3** Press  or  FUNCTION button to indicate the type of component you want to program with the remote control.

 You must do step 4 within 10 seconds of step 3, or you must redo steps 2 and 3.

**4** Use the  buttons to enter the three-digit manufacturer's code number.

**5** Press .

**6** To check if the code number works, aim the TV's remote control at the component and press on the green POWER button (VCR/DVD, SAT/CABLE, TV) that corresponds with that component. If it responds, you are done. If not try using another code listed for that manufacturer.

 If you have problems programming your remote control, see "Troubleshooting" on page 42.

**Manufacturer's Codes****VCRs**

<b>Manufacturer</b>	<b>Code</b>
Sony	301, 302, 303
Admiral	327
(M. Ward)	
Aiwa	338, 344
Audio Dynamic	314, 337
Broksonic	319, 317
Canon	309, 308
Citizen	332
Craig	302, 332
Criterion	315
Curtis Mathes	304, 338, 309
Daewoo	341, 312, 309
DBX	314, 336, 337
Dimensia	304
Emerson	319, 320, 316, 317, 318, 341
Fisher	330, 335
Funai	338
General Electric	329, 304, 309
Go Video	322, 339, 340
Goldstar	332
Hitachi	306, 304, 305, 338
Instant Replay	309, 308
JC Penney	309, 305, 304, 330, 314, 336, 337
JVC	314, 336, 337, 345, 346, 347
Kenwood	314, 336, 332, 337
LXI (Sears)	332, 305, 330, 335, 338
Magnavox	308, 309, 310
Marantz	314, 336, 337
Marta	332
Memorex	309, 335
Minolta	305, 304
Mitsubishi/ MGA	323, 324, 325, 326
Multitech	325, 338, 321
NEC	314, 336, 337
Olympic	309, 308
Optimus	327
Panasonic	308, 309, 306, 307

Pentax	305, 304
Philco	308, 309
Philips	308, 309, 310
Pioneer	308
Quasar	308, 309, 306
RCA/ PROSCAN	304, 305, 308, 309, 311, 312, 313, 310, 329
Realistic	309, 330, 328, 335, 324, 338
Sansui	314
Samsung	322, 313, 321
Sanyo	330, 335
Scott	312, 313, 321, 335, 323, 324, 325, 326
Sharp	327, 328
Shintom	315
Signature 2000	338, 327
(M. Ward)	
SV2000	338
Sylvania	308, 309, 338, 310
Symphonic	338
Tashiro	332
Tatung	314, 336, 337
Teac	314, 336, 338, 337
Technics	309, 308
Toshiba	312, 311
Wards	327, 328, 335, 331, 332
Yamaha	314, 330, 336, 337
Zenith	331

**DVD Players**

<b>Manufacturer</b>	<b>Code</b>
Sony	751
Hitachi	758
JVC	756
Magnavox	757
Mitsubishi	761
Onkyo	762
Oritron	759
Panasonic	753
Philips	757
Pioneer	752
RCA	755
Samsung	758
Toshiba	754
Zenith	760

**Cable Boxes**

<b>Manufacturer</b>	<b>Code</b>
Sony	230
Hamlin/Regal	222, 223, 224, 225, 226
Jerrold/G.I./ Motorola	201, 202, 203, 204, 205, 206, 207, 208, 218
Oak	227, 228, 229
Panasonic	219, 220, 221
Pioneer	211, 214, 215
Scientific Altanta	209, 210, 211
Tocom	216, 217
Zenith	212, 213

**Satellite Receivers**

<b>Manufacturer</b>	<b>Code</b>
Sony	801
DIRECT TV	809
Dish Network	810
Echostar	810
General Electric	802
Hitachi	805
Hughes	804
Mitsubishi	809
Panasonic	803
RCA/ PROSCAN	802, 808
Toshiba	806, 807

**Laserdisc Players**

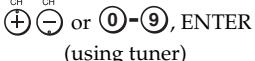
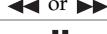
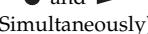
<b>Manufacturer</b>	<b>Code</b>
Sony	701
Panasonic	704, 710
Pioneer	702

**DVD/VCR Combination Units**

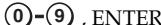
<b>Manufacturer</b>	<b>Code</b>
Sony	601
Broksonic	605
JVC	604
Panasonic	609
Samsung	603
Toshiba	602

# Using your TV Remote Control with Other Equipment

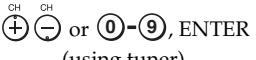
## Operating a VCR

Press	To
	Activate the remote control to operate the VCR (FUNCTION button)
	Power on/off the VCR (VCR/DVD green button)
 or  , ENTER (using tuner)	Change channels
	Play video tape
	Stop
	Rewind or Fast-forward a video tape
	Pause
	Record
	Switch between VCR and TV inputs

## Operating a DVD Player

Press	To
	Activate the remote control to operate the DVD (FUNCTION button)
	Power on/off the DVD (VCR/DVD green button)
 , ENTER	Select chapters
	Search chapters forward or backward
	Play DVD
	Stop
	Pause
	Search the picture forward or backward during playback
	Display the DVD menu
	Use the arrow buttons to move the cursor in the menu, and the center button to select an option
	Switch between DVD and TV inputs

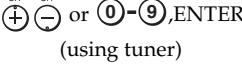
## Operating a Cable Box or Satellite Receiver

Press	To
	Activate the remote control to operate the cable box or satellite receiver (FUNCTION button)
	Power on/off the cable box or satellite receiver (SAT/CABLE green button)
 or  , ENTER (using tuner)	Change channels
	Change back to previous channel
	Display channel number (satellite receiver)

**Operating a Cable Box or Satellite Receiver**

Press	To
GUIDE	Display SAT Guide (satellite receiver)
MENU	Display SAT Menu (satellite receiver)
	Use the arrow buttons to move the cursor in the menu, and the center button to select an option (satellite receiver)
TV/SAT	Press to switch between the TV and SAT inputs (satellite receiver)

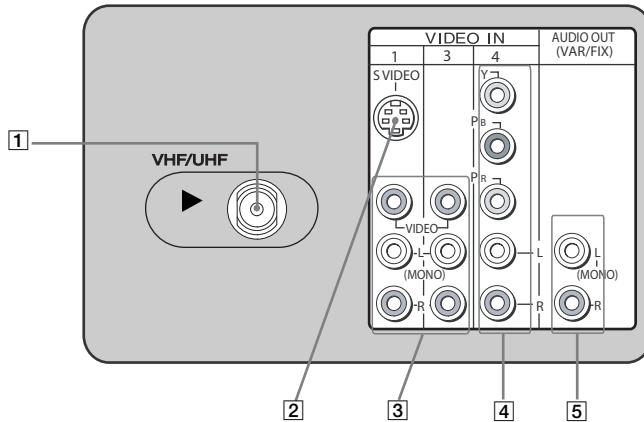
**Operating a DVD/VCR Combination Unit**

Press	To
VCR/DVD	Activate the remote control to operate the DVD/VCR (FUNCTION button)
VCR/DVD	Power on/off the DVD/VCR combination unit (VCR/DVD green button)
	When the VCR is not playing,  switches between the DVD player and VCR's tuner
MENU	Display the DVD Menu
▶	Play
■	Stop
■■	Pause
◀◀ or ▶▶	Rewind or fast-forward a video tape (VCR) Search the picture forward or backward during playback (DVD)
	Use the arrow buttons to move the cursor in the menu, and the center button to select an option (DVD)
▶ and ● (Simultaneously)	Record (VCR)
	Change channels (VCR) (using tuner)

# Connecting Your TV

Read this section before setting up your TV for the first time. This section explains how to make the basic connections and how to connect optional equipment.

## TV Rear Panel



Jack	Description
<b>1 VHF/UHF</b>	This input connects to your VHF/UHF antenna or cable.
<b>2 S VIDEO</b>	This input connects to the S VIDEO OUT jack on your VCR or other video equipment that has S VIDEO. S VIDEO provides better picture quality than the VHF/UHF jacks or the video input jack. S VIDEO does not provide sound, so you still must connect the audio cables.
<b>3 VIDEO/AUDIO L(MONO), R</b>	This input connects to the AUDIO/VIDEO output jacks on your VCR or other video equipment. A third video input jack (VIDEO 2) is located on the front panel of the TV. These AUDIO/VIDEO input jacks provide better picture quality than the VHF/UHF jack.

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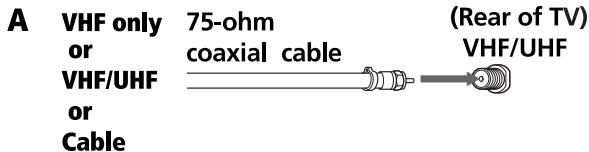
<b>4</b>	<b>Y, P<sub>B</sub>, P<sub>R</sub>/ L, R</b>	This input connects to the component video Y, P <sub>B</sub> , P <sub>R</sub> , and AUDIO L, R jacks on your DVD player or digital set-top box (480i only).
<b>5</b>	<b>AUDIO OUT (VAR/FIX) L(MONO), R</b>	This jack connects to the Audio input jacks on your audio equipment. You can listen to your TV's audio through your stereo system.

---

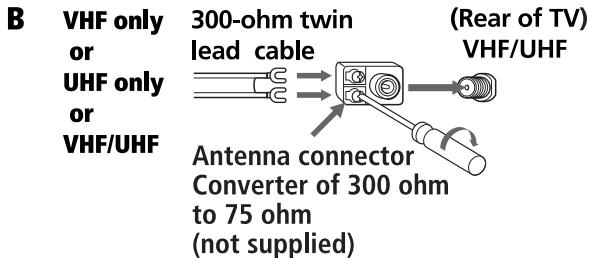
# Basic Connections

## TV with Cable, Indoor, or Outdoor Antenna

Depending on the cable system available in your home, choose one of the connections below:



Use this to connect the TV to a cable system or an antenna with a 75-ohm cable (usually built into newer homes).

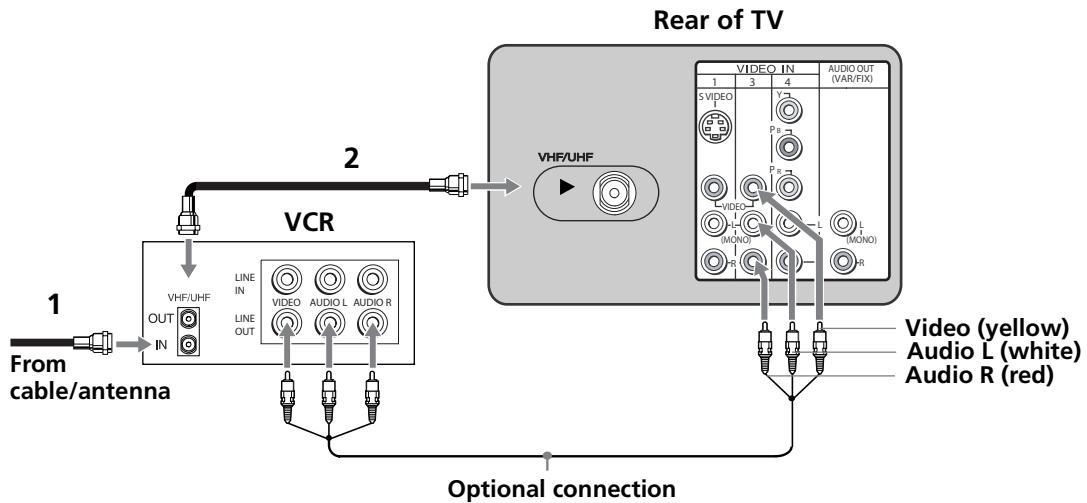


Use this to connect the TV to a dipole antenna, also known as a “rabbit ears” antenna (usually found in older homes).

 If you are connecting to an indoor or outdoor antenna, you may need to adjust the orientation of the antenna for the best reception.

# Connecting Additional Equipment

## Connecting a TV and VCR



- 1 Connect the coaxial cable from your TV antenna or cable service to the IN jack on your VCR.
- 2 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

### Optional connection

- If your VCR is equipped with video outputs, you can get better picture quality by connecting audio/video cables (not supplied) from AUDIO/VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.
- For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.

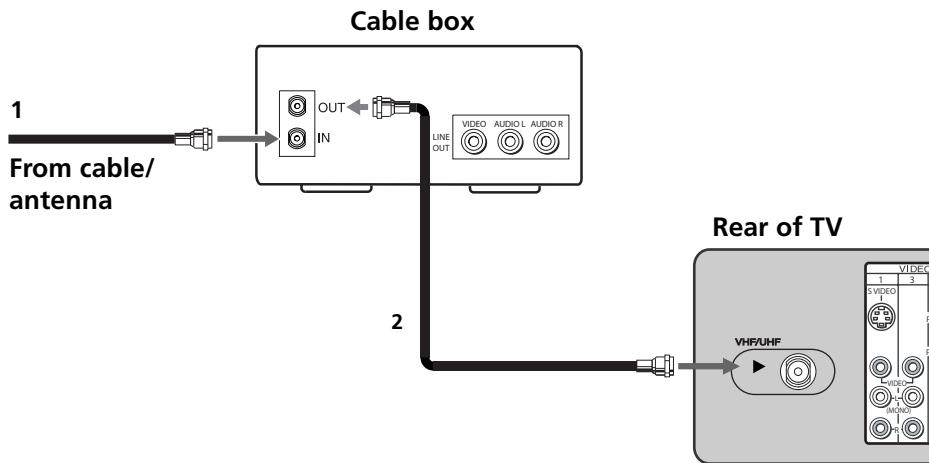
### Using your TV with this connection

This connection allows you to do the following:

- Program your Sony remote control to operate your VCR (see page 5).
- To activate your remote, press  (FUNCTION button) to operate your VCR. To do this, first program your remote control, then use the Channel Fix feature to set your TV to channel 3 or 4 (see page 31).
- Press  repeatedly to switch between VCR input (VIDEO input) and VHF/UHF (local channels).

## TV and Cable Box

Some cable TV systems use scrambled or encoded signals that require a cable box to view all channels. If you subscribe to such type of service, use this connection.



- 1 Connect the coaxial cable from your cable service to the IN jack on your cable box.
- 2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the VHF/UHF jack on your TV.

### Using your TV with this connection

This connection allows you to do the following:

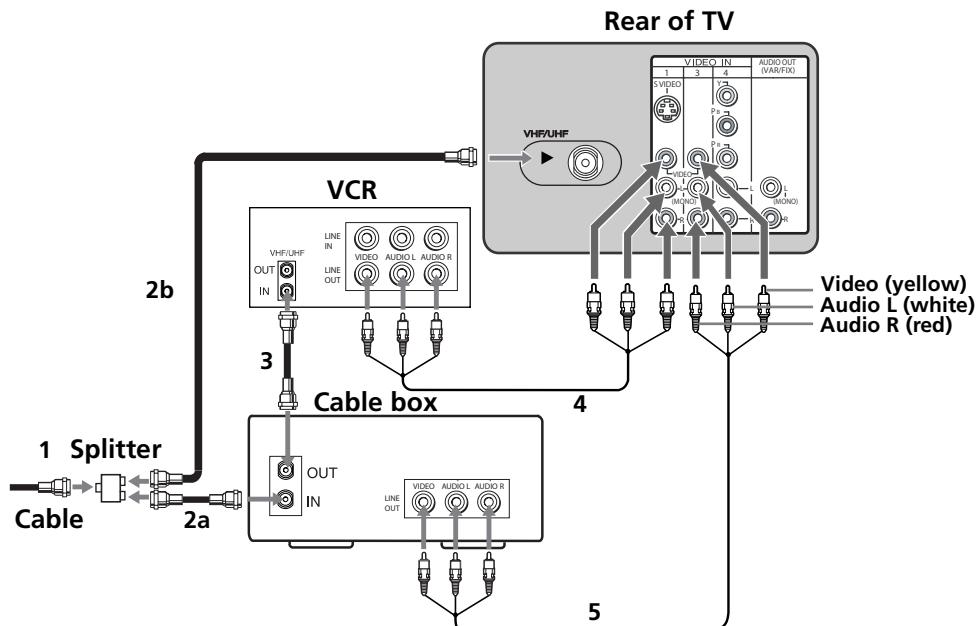
- Program your Sony remote control to operate your cable box (see page 5).
- To activate your remote press SAT/CABLE (FUNCTION button) to operate your cable box and then use the ①-⑨ buttons or CH+/- buttons to change the channels. In order to do this, first program your remote control, then use the Channel Fix feature to set your TV to channel 3 or 4 (see page 31).

## Connecting a TV, VCR, and Cable Box

 **DIGITAL CABLE BOX USERS:** If you are connecting a digital cable box, you will need a special bi-directional splitter (5-900 Mhz minimum) that is designed to work with your digital cable box.

Use this connection if you subscribe to a cable system that scrambles some channels (pay channels), but not all of them. This setup allows you to:

- change channels through your cable box or VCR when you are receiving a scrambled signal
- change channels through your TV



- 1 Connect the single input jack of the splitter (not supplied) to your incoming cable connection.
- 2 Using coaxial cables (not supplied), connect the two output jacks of the splitter (not supplied) to:
  - a) the IN jack on your cable box
  - b) the VHF/UHF jack on the TV
- 3 Using a coaxial cable (not supplied), connect the OUT jack on your cable box to the IN jack on your VCR.
- 4 Using the audio/video cables (not supplied), connect the AUDIO VIDEO OUT on your VCR to the AUDIO/VIDEO IN on your TV.
- 5 Using the audio/video cables (not supplied), connect the AUDIO VIDEO OUT on your cable box to the AUDIO/VIDEO IN on your TV.

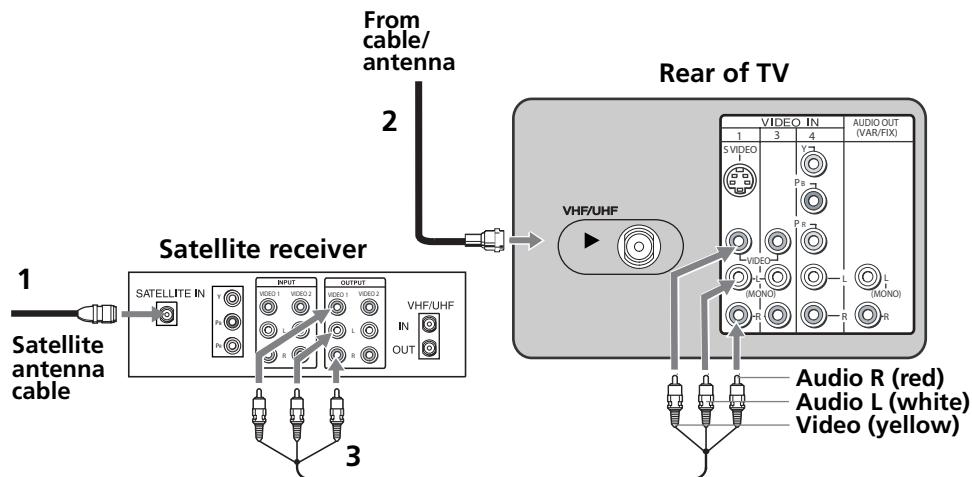
## Optional connection

- ❑ For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.

## Using your TV with this connection

- ❑ Program your Sony remote control to operate your VCR or cable box (see page 5).
- ❑ To activate your remote, press  (FUNCTION button) to operate your VCR or  (FUNCTION button) to operate your cable box. To do this, first program your remote control, then use the Channel Fix feature to set your TV to channel 3 or 4 (see page 31).
- ❑ Press  repeatedly to switch between VCR input (VIDEO input), VHF/UHF (local channels or unscrambled), or cable box (cable system or scrambled channels).

## Connecting a TV and Satellite Receiver



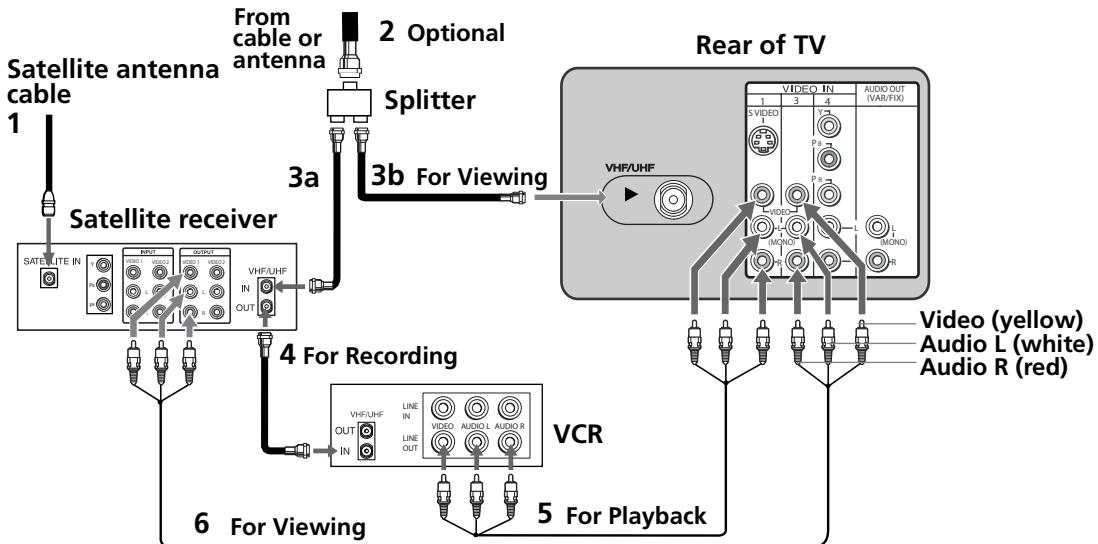
- 1 Connect the cable from your satellite antenna to SATELLITE IN on your satellite receiver.
- 2 Connect the coaxial cable from your cable service or antenna to the VHF/UHF jack on your TV.
- 3 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your satellite receiver to AUDIO/VIDEO IN on your TV.

### Using your TV with this connection

This connection allows you to do the following:

- ❑ Program your Sony remote control to operate your satellite receiver (see page 5).
- ❑ To activate your remote, press (FUNCTION button) to operate your satellite receiver. See page 7 on how to operate other functions.
- ❑ Press repeatedly to switch to satellite receiver input (VIDEO input).

## Connecting a TV, VCR, Cable/Antenna, and Satellite Receiver using Composite Video (VIDEO/AUDIO L(MONO), R)



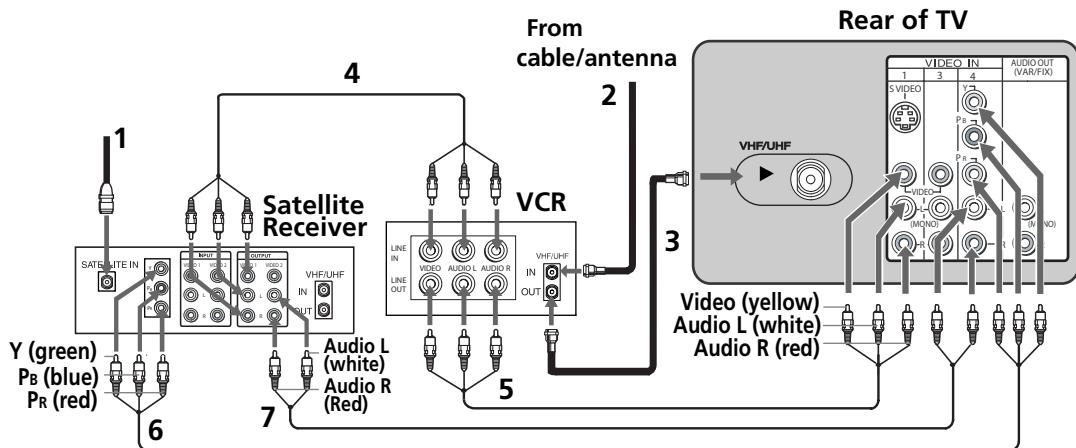
- 1 Connect the cable from your satellite antenna to SATELLITE IN on your satellite receiver.
- 2 Connect the single input jack of the splitter (not supplied) to your incoming cable/antenna (optional connection to view local channels or broadcast).
- 3 Using coaxial cables (not supplied), connect the two output jacks of the splitter (not supplied) to:
  - a) the IN jack on your satellite receiver
  - b) the VHF/UHF jack on the TV
- 4 Using a coaxial cable (not supplied), connect the OUT jack on your satellite receiver to the VHF/UHF IN on your VCR.
- 5 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your VCR to the AUDIO/VIDEO IN on your TV.
- 6 Using audio/video cables (not supplied), connect the AUDIO/VIDEO OUT on your satellite receiver to the AUDIO/VIDEO IN on your TV.

### Using your TV with this connection

This connection allows you to do the following:

- Program your Sony remote control to operate your VCR or satellite receiver (see page 5).
- To activate your remote, press VCR/DVD (FUNCTION button) to operate your VCR or SAT/CABLE (FUNCTION button) to operate your satellite receiver.
- Press TV/VIDEO repeatedly to switch between VCR input (VIDEO input), VHF/UHF (local channels or unscrambled), or your cable box (cable system or scrambled channels).

## Connecting a TV, VCR, and Satellite Receiver using Component Video (Y, Pb, Pr)



- 1 Connect the coaxial cable from your satellite antenna to SATELLITE IN on the satellite receiver.
- 2 Connect the coaxial cable from your cable service or antenna to the IN jack on your VCR.
- 3 Using a coaxial cables (not supplied), connect the OUT jack on your VCR to the VHF/UHF jack on your TV.
- 4 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your satellite receiver to AUDIO/VIDEO IN on your VCR.
- 5 Using audio/video cables (not supplied), connect the AUDIO/VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.
- 6 Using component video cables (not supplied), connect the Y, Pb, Pr OUT on your satellite receiver to Y, Pb, Pr IN on your TV.
- 7 Connect AUDIO OUT on your satellite receiver to AUDIO IN on your TV.

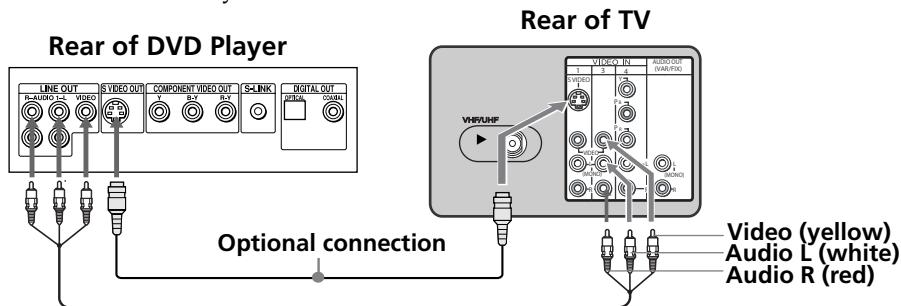
### Using your TV with this connection

This connection allows you to do the following:

- Program your Sony remote control to operate your VCR or satellite receiver (see page 5).
- Turn on your VCR to enable your satellite receiver to work with this connection.
- To activate your remote, press VCR/DVD (FUNCTION button) to operate your VCR or SAT/CABLE (FUNCTION button) to operate your satellite receiver.
- Press TV/VIDEO repeatedly to switch between VCR input (VIDEO input), VHF/UHF (local channels or unscrambled), or your cable box (cable system or scrambled channels).

## Connecting a DVD Player using Composite Video (VIDEO/AUDIO L(MONO),R)

Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your DVD player to AUDIO/VIDEO IN on your TV.

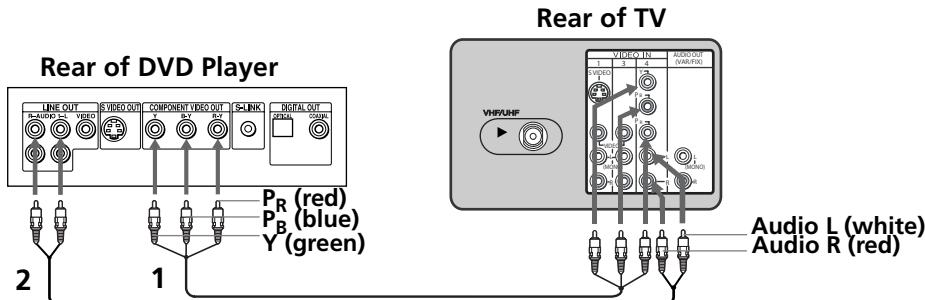


### Optional connection

- For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.

## Connecting a DVD Player using Component Video (Y, Pb, Pr/R, L)

If your DVD player is equipped with component video outputs (Y, Pb, Pr), you can improve the picture quality by using component video cables (480i only).



- Using component video cables (not supplied), connect the Y, Pb, Pr OUT on your DVD player to Y, Pb, Pr IN on your TV.
- Connect AUDIO OUT on your DVD player to AUDIO IN on your TV.

The Y, Pb, Pr outputs on your DVD player are sometimes labeled Y, Cb, and Cr or Y, B-Y, and R-Y. If so, connect the cables to like colors.

### Using your TV with this connection

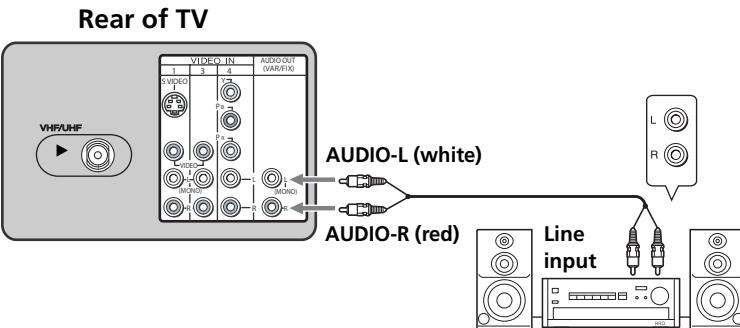
This connection allows you to do the following:

- Program your Sony remote control to operate your DVD (see page 5).
- To activate your remote, press (FUNCTION button) to operate your DVD (see page 7).
- Press repeatedly to switch to the DVD player's input (VIDEO input).

## Connecting an Audio System

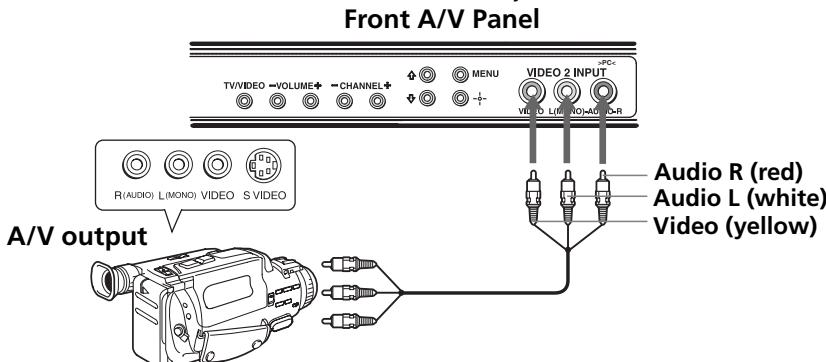
 If you are connecting a Home Theater, please refer to your Home Theater manual for additional connections.

- 1 Using audio/video cables (not supplied), connect AUDIO OUT on your TV to one of the unused line inputs (e.g. TV, AUX, TAPE2) on your stereo.
- 2 Set the Speaker option to Off. For more instructions, see "Using the Audio Menu" on page 29.
- 3 After you connect the audio system, you can control the volume level from your TV or audio system.
  - To control the volume from the TV, use the front panel controls or the VOL +/- buttons on the remote.
  - To control the volume through the connected audio system, open the Audio Out option on the Audio Menu and select Fixed. For more instructions, see "Using the Audio Menu" on page 29.



## Connecting a Camcorder (for playback)

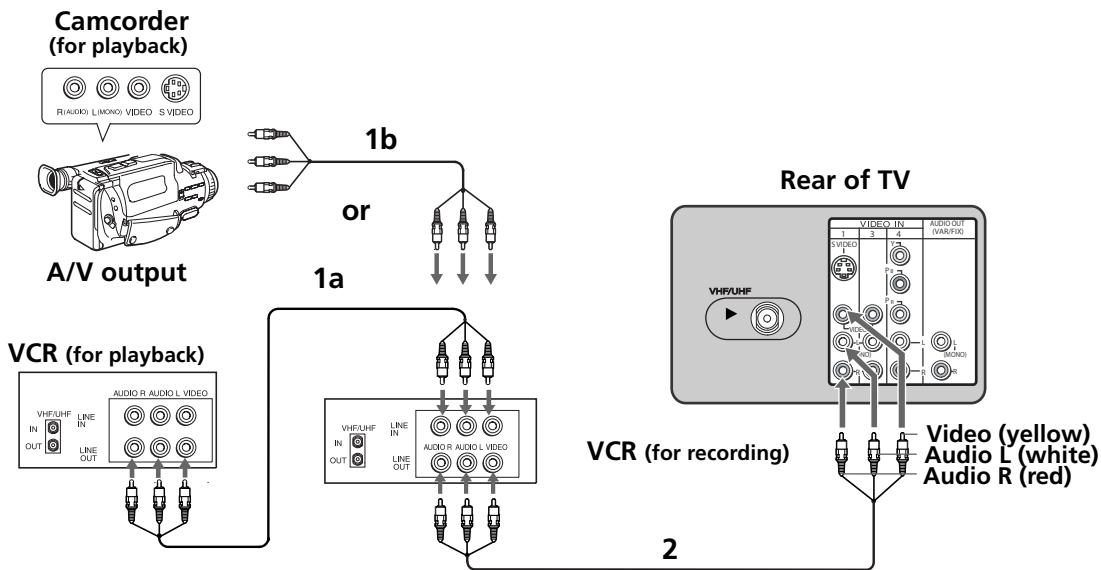
To connect your camcorder, you can use the Audio/Video inputs on either the front or rear panel of the TV. Using the audio/video cables (not supplied), connect the AUDIO/VIDEO OUT on your camcorder to the AUDIO/VIDEO IN on your TV.



### Optional connection

- For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.

## Connecting for Video Tape Editing (VCR and Camcorder)



- 1 For video tape editing connect to the VCR the following sources (VCR or Camcorder):
  - ❑ Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your first VCR to AUDIO/VIDEO IN on your second VCR (option 1a)
  - ❑ Using audio/video cables (not supplied), connect the AUDIO/VIDEO OUT on your Camcorder to the AUDIO/VIDEO IN on your second VCR (option 1b)
- 2 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on the second VCR to the AUDIO/VIDEO IN on your TV.

### Using your TV with this connection

This connection allows you to do the following:

- ❑ Program your Sony remote control to operate your VCR (see page 5).
- ❑ To activate your remote, press (FUNCTION button) to operate your VCR, see page 7 on how to operate other functions.



# Using Basic Functions

## Setting Up the TV

After you have finished connecting your TV, you can use Auto Program to set up your channels. During Auto Program, the TV will automatically search for available channels and program receivable channels.

 When you start Auto Program wait until it is finished; otherwise it will skip over channels that are available. Perform Auto Program again to program receivable channels.

- 1 Press  to turn on the TV. The Initial Setup screen appears.



- 2 Press  on the remote control or on the TV front panel to start Auto Program, or press  to exit.

 The Initial Setup screen appears each time you turn on the TV until you perform Auto Program.

### To perform Auto Program again

- 1 Press .
- 2 Press  to highlight Channel Menu.
- 3 Press  to highlight Cable. Press  to select.
- 4 Press  or  to highlight On or Off according to how you connected your TV. Press  to select.
- 5 Press  to highlight Auto Program. Press  to search for channels.
- 6 After Auto Program finishes, press  to exit.

### To reset the TV to factory settings

- 1 Turn the TV on.
- 2 Hold down  on the remote control.
- 3 Press and release the POWER button on the TV front panel. The TV will turn itself off, then back on.
- 4 Release .

## Quick Start to the Menus

The following settings are available in your on-screen menus. For more details on how to use the menus, see "Using the Menus" on page 27.

### Menu

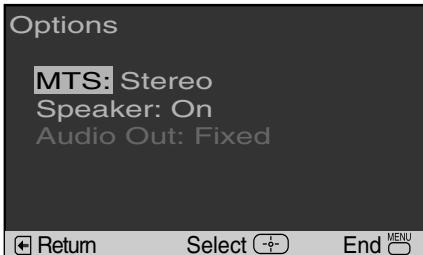


### Allows you to



Adjust your picture settings.

### Basic Functions



Change your audio settings.



Customize your channel settings.



Set rating limits on your TV based on program rating or content.

**Menu****Allows you to**

Set the clock on your TV and program scheduled viewing using Timer 1 and Timer 2.



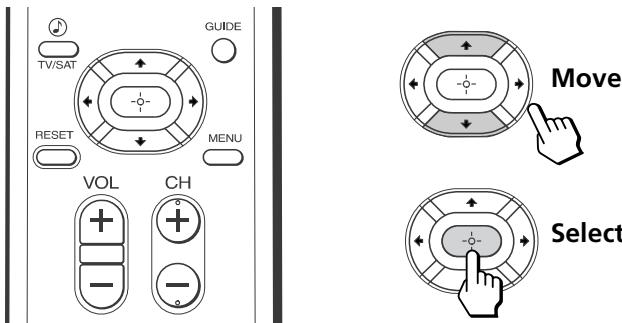
Select closed captioning options, display the name of the current program and its remaining time (Info Banner), label video inputs, adjust tilt correction, enhance your DVD picture resolution (16:9 Enhanced) or select menu language.



# Using the Menus

This section shows the options available for setting up and adjusting the TV.

## Using the Remote Control to Navigate on the On-Screen Menus



To navigate on the on-screen menus, use the “arrow” buttons (↑, ↓, ←, →) to move the cursor. Pressing these arrows will cause the cursor to move in the corresponding direction. Pressing center button ( ⊞ ) will allow you to select an option.

## How to Access Menus

### To Access Menus

- 1 Press  to display the on-screen menu.
- 2 Use the ← or → buttons to highlight the desired menu icon. Press  to select it.
- 3 Use the ↑ or ↓ buttons to scroll up and down through the features.
- 4 Follow the instructions on the screen.
- 5 For instructions on using a specific menu, see the page in this section that talks about that menu.
- 6 Press  to exit the menu.

 Press  once to display the on-screen menu, and press again to return to normal viewing. If no buttons are pressed, the menu closes automatically after about 90 seconds.

# Using the Video Menu

To access the Video menu, use the following steps:



Press  to highlight an option; then press .

<b>Mode</b> <i>Customized picture viewing</i>	Use the  or  buttons to highlight one of the following options, then press  to select it.
<b>Vivid:</b>	Select for enhanced picture contrast and sharpness.
<b>Standard:</b>	Select for a standard picture.
<b>Movie:</b>	Select for a finely detailed picture.
<b>Pro:</b>	Select for natural picture and sharpness.

 Press  on the remote control for direct access to the picture modes (Vivid, Standard, Movie, Pro).

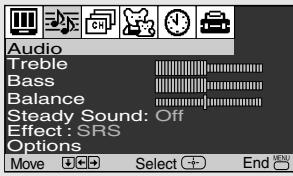
<b>Picture Control</b>	With the Picture Controls menu open, press  or  to select one of the following option:
<b>Picture:</b>	Press  to decrease the contrast. Press  to increase contrast.
<b>Brightness:</b>	Press  to darken the picture. Press  to brighten the picture.
<b>Color:</b>	Press  to decrease color saturation. Press  to increase color saturation.
<b>Hue:</b>	Press  to increase the red tones. Press  to increase the green tones.
<b>Sharpness:</b>	Press  to soften the picture. Press  to sharpen the picture.

<b>Color Temp.</b> <i>White color tint adjustment</i>	Use the  or  buttons to select from one of the following options:
<b>Cool:</b>	Gives the white colors a blue tint.
<b>Neutral:</b>	Gives the white colors a neutral tint.
<b>Warm:</b>	Gives the white colors a red tint.
<b>ClearEdge VM</b>	Sharpens picture definition to give objects a crisp edge. Use the  or  buttons to highlight of the following options: <b>High, Low, Off</b> ; then press to  select it.

# Using the Audio Menu

To access the Audio menu, use the following steps:

**To Display**  **To Highlight**  **To Select** 



Press  to highlight an option; then press .

**Treble** Press  to decrease the higher pitched sounds. Press  to increase the higher pitched sounds.

**Bass** Press  to decrease the lower pitched sounds. Press  to increase the lower pitched sounds.

**Balance** Press  to emphasize the left speaker. Press  to emphasize the right speaker.

**Steady Sound** Press  or  to select one of the following options:

*Stabilizes volume* **On:** Select to stabilize the volume when changing channels.

**Off:** Select to turn Steady Sound off.

**Effect** Use the  or  buttons to highlight one of the following options, then press  to select it.

**Simulated:** Simulates theater quality sound for mono programs.

**SRS:** Produces a dynamic three-dimensional sound for stereo programs.

**Off:** Normal stereo or mono reception.

  Press  to directly select Effect settings (Simulated, SRS, Off).

**Options** Use these features to change your Audio setting.

**MTS** Use the  or  buttons to highlight one of the following options, then press  to select it.

*Multi-Channel* **Stereo:** Select when viewing a broadcast in stereo.

*TV Sound* **Auto SAP:** Select to have the TV automatically switch to a Second Audio Program (SAP) when a signal is received.

**Mono:** Select to reduce noise in areas of poor reception.

**Speaker** Use the  or  buttons to highlight one of the following options, then press  to select it.

*Custom selection of audio output source* **On:** Select to listen to the sound from the TV speakers with or without a separate stereo system.

**Off:** Select to turn off the TV speakers and listen to the TV's sound only through external audio system speakers.

**Audio Out** Use the  $\uparrow$  or  $\downarrow$  buttons to highlight one of the following options, then press  $\text{OK}$  to select it.

*Use to control the TV's volume through a stereo*

**Variable:** Adjust the volume through your TV.

**Fixed:** Adjust the volume through a connected stereo.

 Press  to directly select MTS settings (Stereo, Auto SAP, Mono).

 If your TV is set to Auto SAP, some programs may be muted or distorted. If your TV does not output sound, change your Audio MTS setting to Stereo or Mono.

 You can only set Audio Out settings when you have set Speaker to Off.

# Using the Channel Menu

To access the Channel menu, use the following steps:

**To Display**



**To Highlight**



**To Select**



Press to highlight an option; then press .

## **Favorite Channels**

*Quick access to favorite channels*

- 1 Use the or buttons to highlight the position (1-8) where you want to set a favorite channel, then press .
- 2 Use the or buttons to find the channel you want to add to your favorite channels.
- 3 Press to select the channel. The TV will automatically change to the selected channel.
- 4 Press to return to the Channel menu or press to exit.



To use Favorite Channels, exit all menus and press . Press or to move the cursor to the desired channel number and press .

## **Cable**

Use the or buttons to highlight one of the following options, then press to select it.

**On:** Select if you are receiving cable channels with a CATV cable.  
**Off:** Select if you are using a TV antenna.



After changing your cable settings, you will need to perform Auto Program. See "To perform Auto Program again" on page 23.

## **Channel Fix**

Use the or buttons to highlight one of the following options, then press to select it.

**Off:** Channel Fix is not set.  
**2-6:** Select when you want to control all channel selection through a cable box or VCR. Select the appropriate channel (usually 3 or 4) and use the cable box's or VCR's remote control for channel selection.  
**Video 1:** Select from available video inputs when you have connected video equipment (e.g., a satellite receiver) and you want your TV fixed to it.

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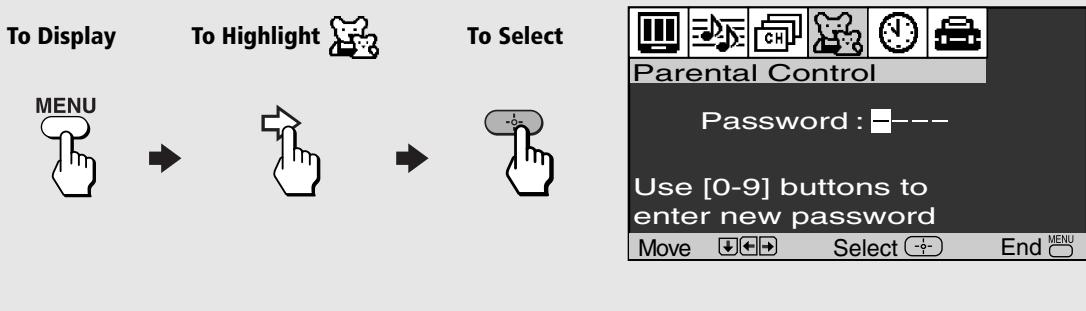
<b>Auto Program</b>	Perform Auto Program whenever setting up your TV. Auto Program will search for available channels and program receivable channels.
<b>Channel Skip/Add</b>	<p>Use this feature after you run Auto Program to skip unwanted channels or add new ones.</p> <ol style="list-style-type: none"><li>1 Use the <math>\uparrow</math> or <math>\downarrow</math> buttons to highlight the position of the desired channel, then press <math>\text{[+}]</math>.</li><li>2 Use the <math>\uparrow</math> or <math>\downarrow</math> buttons to highlight <b>Skip</b> or <b>Add</b>, then press <math>\text{[+}]</math>.</li><li>3 Press <math>\leftarrow</math> to return to the Channel menu or press <math>\text{[MENU]}</math> to exit.</li></ol>
<i>Label up to 40 channels with their call letters</i>	<p> Press CH + or CH - to skip over channels that have been skipped. You can still use the ①-⑨ buttons to directly tune to skipped channels.</p> <p><b>Channel Label</b></p> <ol style="list-style-type: none"><li>1 Press <math>\text{[+}]</math>, then use the <math>\uparrow</math> or <math>\downarrow</math> buttons until you reach the desired channel number.</li><li>2 Press <math>\text{[+}]</math> to activate the channel.</li><li>3 Press <math>\downarrow</math> to highlight <b>Label</b>, then press <math>\text{[+}]</math>. Use the <math>\uparrow</math> or <math>\downarrow</math> buttons to display the first call letter or number of the label. Press <math>\text{[+}]</math> to select. Repeat this process until you finish selecting all the call letters.</li><li>4 When finished, press <math>\text{[+}]</math> to activate.</li><li>5 Press <math>\leftarrow</math> to return to the Channel menu or press <math>\text{[MENU]}</math> to exit.</li></ol>



You cannot use Favorite Channels, Cable, Channel Skip/Add, or Channel Label when Channel Fix is set.

# Using the Parent Menu

To access the Parent menu, use the following steps:



The Parental Control feature helps parents monitor what their children watch on television.

## To use the Parent Menu

When you select the Parent menu, you are prompted to set a 4-digit password. You cannot access the Parent menu settings without this password.

- 1 Use the **①-⑨** buttons to enter a 4-digit password.
- 2 Confirm your password by entering it again.

 Keep this manual in a safe place. You need your password for any future access to the Parent menu. If you forget your password, see page 41.

# Parental Control

## Setting the Rating

You can change the Rating by selecting one of the Parental Lock options.



- 1 Press  $\downarrow$  to highlight **Parental Lock**, then press  $\circ$ .

If you are not familiar with Parental Guideline rating system, use one of the following preset categories to simplify the rating selection: Child, Youth, Young Adult.

- 2 Use the  $\uparrow$  or  $\downarrow$  to highlight the desired rating and press  $\circ$ .

Rating	TV will allow a maximum rating of
Off	No rating limit
Child	TV-Y, TV-G, G (U.S.), G, C (Canada)
Youth	TV-PG, PG (U.S.), 8 ans + (Canada)
Young Adult	TV-14, PG-13 (U.S.), 14+ (Canada)
Custom	Select to set more restrictive ratings (see next section)

## Changing your Password

- 1 Use the  $\uparrow$  or  $\downarrow$  buttons to highlight **Change Password** and press  $\circ$ .
- 2 Follow steps 1 and 2 for "Using the Parent Menu" on page 33.

## Select a Country

Select U.S.A. to use US ratings (see pages 36-37) or select Canada to use Canadian ratings (see page 38). If you select a Country (U.S.A. or Canada) that is not where you live, the rating you select will not be activated.

- 1 Press  $\downarrow$  to highlight **Country**, then press  $\circ$ .
- 2 Use the  $\uparrow$  or  $\downarrow$  to highlight the desired country and press  $\circ$ .

## Information for Parents

### To view a program that exceeds the TV rating

- Press  <sup>ENTER</sup>, then use the **①-⑨** buttons to enter your password.

 Entering your password to view a blocked program will temporarily turn **Parental Lock** to Off. To reactivate your Lock settings, turn the TV off then back on; the TV will return to the settings that you have selected.

## Using the Custom Menu

Follow the instructions on the screen to make your custom settings. Select the country desired for your TV's rating limit. See page 36 for U.S. models and page 38 for Canadian models for more information.

 Once you have blocked a rating or content, all higher ratings or content will be automatically blocked.

# United States: Selecting Custom Rating Options

For the United States, the Custom Rating menu includes the following options: Movie Rating, TV Rating and Unrated. (For Canada, see page 38.)

## Movie Rating

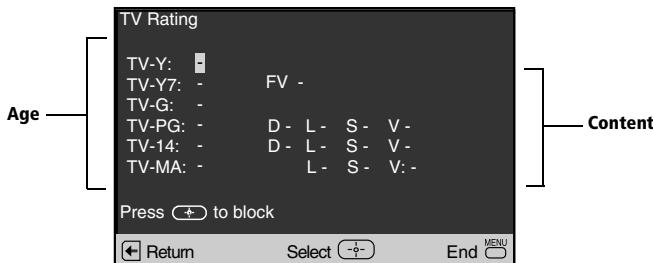
This system defines the rating levels of movies shown in theaters and on prime cable channels.

Rating	Defined as
<b>G</b>	General audience
<b>PG</b>	Parental guidance suggested
<b>PG-13</b>	Parents strongly cautioned
<b>R</b>	Restricted
<b>NC-17</b>	No one 17 and under admitted
<b>X</b>	Adult audience only



## TV Rating

The TV rating is divided into two groups: age-based and content-based.



Age	Defined as
<b>TV-Y</b>	All children
<b>TV-Y7</b>	Directed to older children
<b>TV-G</b>	General audience
<b>TV-PG</b>	Parental guidance suggested
<b>TV-14</b>	Parents strongly cautioned
<b>TV-MA</b>	Mature audience only

Content	Defined as
<b>FV</b>	Fantasy violence
<b>D</b>	Suggestive dialogue
<b>L</b>	Strong language
<b>S</b>	Sexual situations
<b>V</b>	Violence

The content ratings will increase depending on the level of the age-based rating. For example, a program with a TV-PG V (Violence) rating may contain moderate violence, while a TV-14 V (Violence) rating may contain intense violence.

## Unrated

You have the option of blocking TV programs or movies that are not rated.

<b>Allow</b>	Allows all unrated programs
<b>Block</b>	Blocks all unrated programs



 If you choose to block unrated TV programs, please be aware that the following programs may be blocked: emergency broadcasts, political programs, pro, news, public service announcements, religious programs, and weather.

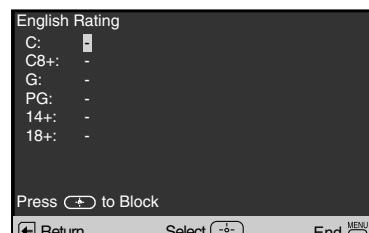
# Canada: Selecting Custom Rating Options

For Canada, the Custom Rating menu includes the following options: English Rating, French Rating, and U.S.A. Rating.

## English Rating

These ratings are for Canadian programs that are broadcast in English.

Rating	Defined as
<b>C</b>	Children
<b>C8+</b>	Children 8 years and older
<b>G</b>	General programming
<b>PG</b>	Parental guidance
<b>14+</b>	Viewers 14 and older
<b>18+</b>	Adult programming



## French Rating

These ratings are for Canadian programs that are broadcast in French.

Rating	Defined as
<b>G</b>	General
<b>8 ans+</b>	Not recommended for younger children
<b>13 ans+</b>	Not recommended for children under age 13
<b>16 ans+</b>	Not recommended for ages under 16
<b>18 ans+</b>	This program is restricted to adults

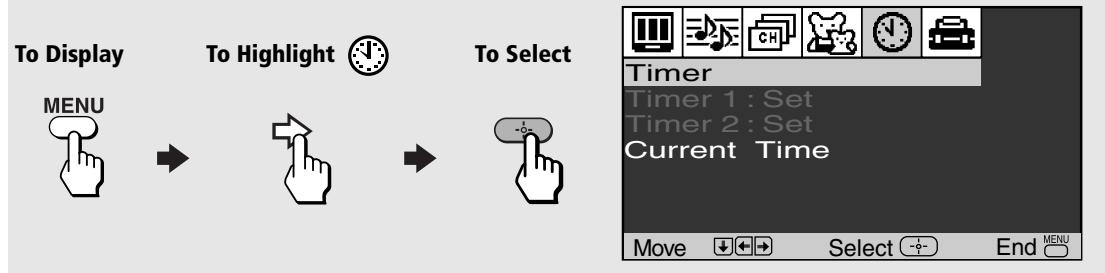


## U.S.A. Rating

For programs from the United States, see "TV Rating" on page 36.

# Using the Timer Menu

To access the Timer menu, use the following steps:



**Current Time** Set your TV to the current day and time. Press  to open the Current Time menu:

- 1 Use the  or  buttons to enter the correct day and time, then press .
- 2 Press  to exit the menu.

 You must set the Current Time before you can use Timer 1 or Timer 2.

**Timer 1 and Timer 2** Use the timers to program your TV to turn on and off by day, time, duration, and channel. The timer duration is a maximum of six hours. When the channel is fixed, it is not necessary to set the channel.

- 1 Use the  or  buttons to highlight **Timer 1** or **Timer 2**, then press .
- 2 Use the  or  buttons to enter the desired day, start time, duration, and channel, then press . The timer status should be On when the Timer has been set, and the timer light on the front panel of the TV should be on.
- 3 Press  to exit the menu.

 Select Off to turn off the Timer. Your previous settings will be saved.

 When you perform Auto Program, Timer 1 and Timer 2 settings will be cleared. Also, in the event of any loss of power, Current Time, Timer 1, and Timer 2 settings will be cleared.

# Using the Setup Menu

To access the Setup menu, use the following steps:

**To Display**



**To Highlight** 



**To Select**



Press  $\downarrow$  to highlight an option; then press  $\circ$ .

## Caption Vision

*Closed-Captioning*

Allows you to select from three closed caption modes for programs that are broadcast with closed captioning.

Use the  $\uparrow$  or  $\downarrow$  buttons to highlight one of the following options, then press  $\circ$  to select it.

**Off:** Caption Vision is not activated.

**CC1, 2, 3, 4:** Displays printed dialogue and sound effects of a program.

**Text1, 2, 3, 4:** Displays network/station information.

## Info Banner

Displays the name of the current program and its remaining time (if available) when you change the channel or press the DISPLAY button. Use the  $\uparrow$  or  $\downarrow$  buttons to highlight one of the following options: **On, Off**. Then press  $\circ$ .

## Video Label

*Label connected equipment*

Allows you to identify the video components connected to the TV: VHS, DVD, etc. When you press TV/VIDEO to switch inputs, the Video Label appears on-screen.

- 1 Press the  $\uparrow$  or  $\downarrow$  buttons to highlight the input you want to label and press  $\circ$ .
- 2 Press the  $\uparrow$  or  $\downarrow$  buttons to highlight a label and press  $\circ$ .
- 3 Press  $\leftarrow$  to return to the Setup menu or press  $\circ$  to exit.

## Tilt Correction

Use the  $\uparrow$  or  $\downarrow$  buttons to set the tilt of the picture from  $-5$  to  $+5$ , then press  $\circ$  to activate.

## Language

Display all menus in the language of your choice.

Use the  $\uparrow$  or  $\downarrow$  buttons to select from one of the following options: **English, Español (Spanish) and Français (French)**. Then press  $\circ$ .

## 16:9 Enhanced

Provides enhanced picture resolution for wide-screen sources such as DVD. This is only available when the TV is in Video mode.

# Other Information

## Troubleshooting

If you have a problem with your TV, try the suggestions below. If the problem persists, see "Contacting Sony" at the end of this section.

### General

Problem	Possible Remedies
<b>I want to reset the TV to the factory settings</b>	<input type="checkbox"/> Turn on the TV. While holding down  on the remote control, press POWER button on the TV front panel. The TV will turn itself off, then back on again. Release  .
<b>The TV is dirty</b>	<input type="checkbox"/> Clean the TV with a soft dry cloth. Never use strong solvents such as thinner or benzine, which might damage the finish of the cabinet.
<b>I lost the parental control password</b>	<input type="checkbox"/> In the password screen, enter the following master password: 4357. After using the master password, you must create a new password. You cannot use the master to unlock currently blocked channels.
<b>There is a black box on the screen</b>	<input type="checkbox"/> You have selected a text option in the Setup menu (page 40) and no text is available. To turn off this feature, select Off in the Caption Vision option. If you were trying to select closed captioning, select CC1-4 instead of Text1-4.
<b>There was a blackout or power outage, and now the TV won't turn on and the timer LED is flashing</b>	<input type="checkbox"/> Press the POWER button on your remote control or on the TV front panel.
<b>Digital cable box does not work</b>	<input type="checkbox"/> Be sure that you have not connected the digital cable box to the TV's TO CONVERTER jack. This jack is not compatible with digital cable boxes. <input type="checkbox"/> If you are connecting a VCR and digital cable box using a splitter, as described in page 14, you must use a special bi-directional splitter (5~900MHz minimum) that is designed to work with your digital cable box.

## Remote Control

Problem	Possible Remedies
<b>I cannot operate the remote control</b>	<input type="checkbox"/> Press TV (FUNCTION) when operating your TV. <input type="checkbox"/> Check the orientation of the batteries. <input type="checkbox"/> Batteries could be weak. Replace them (page 2). <input type="checkbox"/> Move the TV three to four feet away from fluorescent lights.
<b>I cannot change channels with the remote control</b>	<input type="checkbox"/> Make sure you have not inadvertently switched your TV from the channel 3 or 4 setting if you are using another device to change channels. <input type="checkbox"/> If you are using another device to control channels, be sure that you have pressed the FUNCTION button for that device. For example, if you are using your VCR to control channels, be sure to press the VCR/DVD FUNCTION button (page 4).
<b>I lost the remote control</b>	<input type="checkbox"/> You can use the front panel controls to access your menus, change channels, adjust the volume, or change video inputs (page 2). Contact your nearest Sony Dealer to order a replacement, please call our Sony Direct Accessory and Part Center at 1-800-488-7669 (U.S. residents only).

## Programming the Remote Control

Problem	Possible Remedies
<b>More than one code is listed</b>	<input type="checkbox"/> Try entering them one by one until you come to the correct code for your component.
<b>I entered the wrong code number</b>	<input type="checkbox"/> If you enter a new code number, the code number you previously entered at that setting is erased.
<b>I cannot operate a component with the remote control</b>	<input type="checkbox"/> Use the component's own remote control.
<b>When I changed the batteries, the code numbers changed back to the factory settings</b>	<input type="checkbox"/> You must reprogram the remote control (page 5).

## Video

Problem	Possible Remedies
<b>No picture, no sound</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Make sure the power cord is plugged in.</li><li><input type="checkbox"/> If a red light is flashing on the front of your TV for more than a few minutes, disconnect and reconnect the power cord. If the problem continues, call your local service center.</li><li><input type="checkbox"/> Check the TV/VIDEO setting: when watching TV, set it to TV; when watching video equipment, set it to VIDEO 1, 2, 3 or 4 (page 4).</li><li><input type="checkbox"/> Try another channel to rule out station trouble.</li></ul>
<b>Poor or no picture, good sound</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Adjust the <b>Picture</b> setting in the Video menu (page 28).</li><li><input type="checkbox"/> Adjust the <b>Brightness</b> setting in the Video menu (page 28).</li><li><input type="checkbox"/> Check the antenna and/or cable connections (page 11).</li></ul>
<b>No color</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Adjust the <b>Color</b> setting in the Video menu (page 28).</li></ul>
<b>Only snow appears on the screen</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Check the <b>Cable</b> setting in the Channel menu (page 31).</li><li><input type="checkbox"/> Check the antenna and/or cable connections (page 11).</li><li><input type="checkbox"/> Make sure the channel selected is currently broadcasting.</li></ul>
<b>Dotted lines or stripes</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Adjust the antenna.</li><li><input type="checkbox"/> Move the TV away from other electronic equipment. Some electronic equipment creates electrical noise, which can interfere with TV reception.</li></ul>
<b>Double images or ghosts</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Check your outdoor antenna or call your cable service.</li></ul>

## Audio

Problem	Possible Remedies
<b>Good picture, no sound</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Press  so that Muting disappears from the screen (page 3).</li><li><input type="checkbox"/> Check your Audio settings. Your TV may be set to Auto SAP in the MTS feature (page 29).</li><li><input type="checkbox"/> Make sure the speaker option is set to On in the Audio Menu.</li><li><input type="checkbox"/> Adjust TV's volume.</li></ul>
<b>Low or no audio (TV and Cable box)</b>	<ul style="list-style-type: none"><li><input type="checkbox"/> Some cable boxes have volume level controls. Check and see if your cable box or cable box remote has a volume control.</li></ul>

## Channels

Problem	Possible Remedies
<b>I cannot receive higher number channels (UHF) when using an antenna</b>	<input type="checkbox"/> Make sure <b>Cable</b> is set to Off in the Channel menu (page 31). <input type="checkbox"/> Perform Auto Program to add channels that are not presently in the memory (page 23).
<b>Cable stations don't seem to work</b>	<input type="checkbox"/> Make sure <b>Cable</b> is set to On in the Channel menu (page 31). <input type="checkbox"/> Perform Auto Program to add channels that are not presently in the memory (page 23).

## Contacting Sony

Before calling our Customer Information Services Center, reset the TV to factory settings (see page 23). Please have your TV serial number ready. The number is located on the rear of your TV and on the front cover of this manual.

Our Customer Information Services Center phone number is 1-877-899-SONY (7669) (US residents only) or (416) 499-SONY (7669) (Canadian residents only).

# Specifications

Television system	American TV standard/NTSC		
Channel coverage	VHF: 2-13/UHF: 14-69/CATV: 1-125		
Antenna	75-ohm external antenna terminal for VHF/UHF		
Picture tube	FD Trinitron® tube		
Power requirements	120V, 60 Hz		
Supplied accessories	Size AA (R6) batteries (2) Remote Control RM-Y195		
Optional accessories	TV Stand: SU-27FS2		
<b>KV-27FS120</b>			
Screen size	Visible screen size: 679 mm (27 inches) measured diagonally Actual screen size: 736.6 mm (29 inches) measured diagonally		
Inputs/outputs	Inputs	1 video, 1 audio (front) 2 video, 2 audio (rear) 1 S VIDEO 1 RF 1 Y, PB, PR, 1 audio	Outputs 1 AUDIO OUT
Speaker output	10 W x 2		
Power consumption	180 W in use less than 1 W in standby		
Dimensions (W/H/D)	768 x 589 x 497 mm (30 1/4 x 23 1/4 x 19 5/8 inches)		
Mass	45.2 kg (99 lbs. 10 oz)		

*Design and specifications are subject to change without notice.*



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